
From: Barron, Alex
To: McCabe, Janet; Goffman, Joseph
CC: Tsirigotis, Peter; Dunham, Sarah; Culligan, Kevin; Harvey, Reid; Beauvais, Joel
Sent: 6/3/2015 5:45:53 PM
Subject: OP comments on 111(d) EG
Attachments: 111(d) OP Comments on Upload Version 6-3-15.docx; 2015 06 02 OP Recommendations to biomass v2.docx; BSER flexibilities comments 6 3 15.docx; List of major suggested changes to EE-RE from OP 06032015.docx; State Measures Comments 6 3 15.docx

Janet, Joe et al. – We are looking forward to our meeting on Friday. In order to use that time effectively, and in recognition of the fact that folks are already working on possible improvements to the package, we wanted to pass along some thoughts in advance. Those that have the bandwidth can hopefully take a look at them between now and the end of the week. *Those pressed for time should focus on the “111(d) Comments on Upload” document.*

Our hope is that, to the extent that there are suggestions in the attached that make sense to everyone on first read, staff can get rolling on implementation and we can use the time on Friday to talk about things where clarification or further discussion is needed.

Please find attached:

- 1) An overall summary of our comments focused in three areas: Priority policy issues, Structural or text streamlining proposals, and Areas in need of clarification/stronger support. (10 pages)

Plus documents with additional detail on some of the topics raised in (1)

- 2) A one pager on an approach to improving and streamlining state measures
- 3) Comments on EE and RE EM&V (mostly EE) (3 pages)
- 4) Comments on biomass, refined from a version that was shared with staff a few weeks ago (2 pages)
- 5) A one pager with a framework on non-essential BSER flexibilities for discussion

We have prioritized getting these to you quickly so please consider them drafts. As always, anyone in OAR is welcome to reach out to our team if they want more info or clarification.

Thanks,
Alex

Alex Barron, Ph.D.
Deputy Associate Administrator
Office of Policy
U.S. Environmental Protection Agency
202-564-3304

From: Purchia, Liz
To: Reynolds, Thomas; McCabe, Janet; Goffman, Joseph; Millett, John; Drinkard, Andrea; Vaught, Laura
Sent: 5/8/2015 2:19:36 PM
Subject: FW: looking for a response
Attachments: markey_warren.pdf

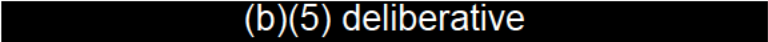
Flagging the attached. I've got a couple inquiries. Do we want to provide what we've used before? Or we could do something simpler like this:

(b) (5)



Previously used this

(b)(5) deliberative



(b) (5)



Additional info

(b) (5)



(b) (5)

(b) (5)

(b)(5) deliberative

From: dawn reeves [mailto:dawn.reeves@iwpnews.com]

Sent: Friday, May 08, 2015 1:01 PM

To: Jones, Enesta; Purchia, Liz

Subject: looking for a response

Hi Enesta and Liz,

Wondering if EPA has a response to the attached letter from Sens. Warren and Markey seeking a moratorium on using biomass for compliance with the Clean Power Plan until a scientific framework on lifecycle emissions is complete.

My deadline is 3 p.m. sharp.

Thanks,

Dawn

703-562*-8766

May 8, 2015

The Honorable Gina McCarthy

Administrator

U.S. Environmental Protection Agency

Ariel Rios Building

1200 Pennsylvania Avenue, N.W.

Washington, DC 20460

Dear Administrator McCarthy,

As strong supporters of the Environmental Protection Agency's Clean Power Plan (Plan), we write to express our concern that any decision by EPA to treat bioenergy as having zero emissions under the Plan could undermine the Plan's intended purpose of reducing power sector carbon emissions. EPA needs time to develop a robust method of accounting for bioenergy emissions at the facility level. Accordingly, we recommend a temporary moratorium on the use of biomass combustion as a method of complying with the requirements of the Plan.

Although we understand that the Plan is not yet final, aspects of the proposed plan indicate that EPA may decide to treat all bioenergy generation as having no greenhouse gas emissions. For example, the equation that EPA used to calculate state-level emissions rate goals includes all of the energy, but none of the emissions, associated with renewable generation—including bioenergy, which is not a zero-carbon technology. Furthermore, EPA Assistant Administrator Janet McCabe suggested in a memorandum issued in November 2014 that EPA may allow states to utilize bioenergy from "sustainably harvested" forest materials as compliance under the Plan. While we support efforts to promote sustainable forestry practices, forest sustainability standards do not typically include carbon accounting as a component.

As EPA knows, wood-burning power plants emit around 3,000 pounds of carbon dioxide per megawatt-hour. A growing body of scientific evidence, including a study commissioned by the State of Massachusetts, ^[1] has found that it takes decades of forest regeneration to offset these emissions. In response to these findings, Massachusetts eliminated renewable energy subsidies for utility-scale wood-burning power plants, finding they compromised the state's ability to achieve its emissions reduction targets. Massachusetts' renewable energy portfolio is now focused on the technologies that produce the most immediate reductions in power sector emissions.

We are concerned that including bioenergy as a compliance measure in the Plan could similarly compromise the Plan's ability to achieve emissions reductions by 2030. The EPA has not determined that any form of biomass combustion is carbon neutral within the compliance timeframe set by the Plan. The Scientific Advisory Board Biogenic Carbon Emissions Panel only just held a meeting at the end of March to review the Framework for Assessing Biogenic CO₂ Emissions from Stationary Sources released in November 2014 and the agency has stated that the review of EPA's biogenic carbon accounting framework will not be completed by the time the Plan is finalized this summer.

The EPA should not approve biomass combustion as a compliance method under the Plan until the agency has a method in place to account for facility-level emissions and a means of ensuring that emissions offsetting actually occurs in an appropriate timeframe. Accordingly, we suggest a moratorium on the use of bioenergy as a compliance measure under the Plan, extending to 2020, when states will have the opportunity to apply for modifications to their implementation plans. This approach has a number of advantages:

- It gives EPA time to finalize a biogenic carbon accounting framework, develop a tool for assessing net carbon emissions at the facility level, and determine how best to count bioenergy emissions under the Plan.
- It avoids incentivizing a carbon-intensive energy source that works against the Plan's objectives and that emerging evidence suggests is contributing to unsustainable deforestation and.
- It focuses near-term state efforts on wind, solar, and other zero-carbon renewable energy technologies whose contribution to the Plan's objectives are well understood.

We urge EPA to complete the process it began several years ago of developing a robust, policy-relevant method of accounting for the net atmospheric impact of bioenergy generation. It is critical that EPA get the accounting right before states commit to measures that could aggravate rather than alleviate climate concerns. A temporary moratorium on using bioenergy as a compliance measure in state implementation of the Clean Power Plan will give the agency time to do so.

Sincerely,

Edward J. Markey

U.S. Senator

Elizabeth Warren

U.S. Senator

[1] Thomas Walker, Peter Cardellichio, John S. Gunn, David S. Saah & John M. Hagan (2013): Carbon Accounting for Woody Biomass from Massachusetts (USA) Managed Forests: A Framework for Determining the Temporal Impacts of Wood Biomass Energy on Atmospheric Greenhouse Gas Levels, *Journal of Sustainable Forestry*, 32:1-2, 130-158

From: McCabe, Janet
To: Lehner, Peter
CC: Yassa, Sami; Stashwick, Sasha; Greene, Nathanael; Goldston, David; Dunham, Sarah; Gunning, Paul; Goffman, Joseph
Sent: 1/21/2015 10:43:54 PM
Subject: Re: Thank you for the meeting

Thanks to all of you for sharing your thoughts with us. This is a complicated and important issue, and we know there is lots to discuss.

From: Lehner, Peter <plehner@nrdc.org>
Sent: Wednesday, January 21, 2015 12:55 PM
To: McCabe, Janet
Cc: Yassa, Sami; Stashwick, Sasha; Greene, Nathanael; Goldston, David
Subject: Thank you for the meeting

Dear Janet,

Thank you again for taking the time to meet with us to discuss the treatment of biomass carbon emissions under the Clean Power Plan last week. I'm sure we all agree that accurately accounting for carbon emitted when large stationary sources burn biomass is critical to reducing greenhouse gas emissions and achieving the Administration's climate goals. It is a complicated subject and we are grateful for the chance to discuss it with you.

There are likely to be categories of biomass that are low carbon or can be considered carbon neutral, but we believe that this determination needs to be made through rigorous, data-driven assessment as part of finalizing EPA's carbon accounting framework. As we explained, we urge you not to prematurely generate exemptions for broad categories of biomass fuel. We look forward to providing you our best thinking on how EPA can ensure that strong rules are in place to guide the industry towards low-carbon biomass fuels and away from the highest carbon feedstocks—in particular whole trees.

Best,

Peter
Peter Lehner
Executive Director
Natural Resources Defense Council
40 West 20th Street, 11th Floor
New York, NY 10011
Phone: 212-727-4571
plehner@nrdc.org

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From: Lehner, Peter
To: McCabe, Janet
CC: Yassa, Sami; Stashwick, Sasha; Greene, Nathanael; Goldston, David
Sent: 1/21/2015 12:55:57 PM
Subject: Thank you for the meeting

Dear Janet,

Thank you again for taking the time to meet with us to discuss the treatment of biomass carbon emissions under the Clean Power Plan last week. I'm sure we all agree that accurately accounting for carbon emitted when large stationary sources burn biomass is critical to reducing greenhouse gas emissions and achieving the Administration's climate goals. It is a complicated subject and we are grateful for the chance to discuss it with you.

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From: McCabe, Janet
To: Lehner, Peter; Atkinson, Emily
CC: Rock, Roseann; Stashwick, Sasha; Yassa, Sami; Greene, Nathanael; Hammel, Debbie
Sent: 1/10/2015 6:33:06 PM
Subject: Re: possible meeting on biomass carbon?

Hi Peter--

I'm looking forward to seeing you next week. I don't know whether we'll be able to find time Tuesday to talk about this topic as well, and I'd want a few others for oar to join us, but I'm copying Emily who can help with the scheduling.

See you soon.

Sent from my iPhone

On Jan 10, 2015, at 6:03 PM, "Lehner, Peter" <plehner@nrdc.org> wrote:

Dear Janet,

Happy New Year! I hope you had some good time with your family over the holidays.

I'm writing to request a meeting at your earliest convenience to discuss the treatment of carbon emissions from biomass under the Clean Power Plan and PSD program. Indeed, I will be in DC meeting with Gina McCarthy (and perhaps you?) on this coming Tuesday regarding the heavy duty vehicle emission rule, so if you had a few minutes before or after it would be extremely convenient. If not, we can find some other time. Please let me know.

As you know, how emissions from biomass are addressed is of great importance. We read your memo on the issue, dated November 19th, 2014, with great interest, but were very concerned to see your office signal to air regulators that you expect that certain broad categories of biomass fuel, such as "sustainably-derived" biomass from forests, will be recognized as acceptable components of state compliance plans before completion of your *Framework for Assessing Biogenic CO₂ Emissions from Stationary Sources*. We have serious objections to the use of "sustainability" as a proxy for carbon accounting, even if it does advance other environmental interests. Instead, we hope EPA will continue to rely on the technical review and Framework development process you set in motion in 2011, which we applaud, and ensure that biomass carbon regulations are driven by a directive and scientifically robust accounting framework.

I very much look forward to discussing this issue in greater detail with you and hope that we can schedule a meeting in the coming weeks.

Peter

Peter Lehner
 Executive Director
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 New York, NY 10011
 Phone: 212-727-4571
plehner@nrdc.org

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From: Goffman, Joseph
To: McCabe, Janet
CC: Dunham, Sarah; Gunning, Paul; Tsirigotis, Peter; Koerber, Mike; Page, Steve; Atkinson, Emily; Stewart, Lori
Sent: 1/11/2015 9:38:11 AM
Subject: Re: possible meeting on biomass carbon?

Thanks. (b) (5)

The groups did file comments opposing the position we suggested in the November 19 memo, on the grounds that what we suggested was in fact and out of sector offset and therefore not legal.

- Joseph Goffman
 Sent from my iPhone

On Jan 10, 2015, at 6:30 PM, "McCabe, Janet" <McCabe.Janet@epa.gov> wrote:

FYI. I think (b)(5) deliberative I Don't know whether the time will work on Tuesday before or after the meetings on vehicles, but if not we'll find another opportunity.

I'll copy Emily on my reply to peter and she'll know to include you guys when a meeting is set up.

Sent from my iPhone

Begin forwarded message:

From: "Lehner, Peter" <plehner@nrdc.org>
Date: January 10, 2015 at 6:03:03 PM EST
To: "McCabe.Janet@epa.gov" <McCabe.Janet@epa.gov>
Cc: "Rock, Roseann" <rrock@nrdc.org>, "Stashwick, Sasha" <slyutse@nrdc.org>, "Yassa, Sami" <syassa@nrdc.org>, "Greene, Nathanael" <ngreene@nrdc.org>, "Hammel, Debbie" <DHammel@nrdc.org>
Subject: possible meeting on biomass carbon?

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To: McCabe, Janet
CC: Rock, Roseann; Stashwick, Sasha; Yassa, Sami; Greene, Nathanael; Hammel, Debbie
Sent: 1/10/2015 6:03:03 PM
Subject: possible meeting on biomass carbon?

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December 1, 2014

Gina McCarthy
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Joint State Comments in Response to EPA's Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Docket ID No. EPA-HQ-OAR-2013-0602

Dear Administrator McCarthy,

We are a group of state environmental agency leaders, energy agency leaders, and public utility commissioners from 14 states.¹ Please accept our joint comments submitted here in response to EPA's proposed Clean Power Plan, which establishes carbon pollution emission guidelines for existing electric utility generating units. The development of these comments was facilitated by the Georgetown Climate Center.

We applaud EPA for proposing a rule that will place the United States on a path to achieving meaningful reductions in carbon pollution, although we recognize that greater overall reductions will be necessary to meet the challenge of climate change. Our states are already demonstrating that significant, cost-effective reductions can be achieved from the power sector through the "system" EPA identifies as the basis for its proposed emission guideline. We therefore support EPA's general approach to setting the emission guideline. We also applaud EPA for providing states flexibility to design their state plans in ways most appropriate to their unique individual and regional circumstances and to use existing climate and energy programs for compliance.

The need to reduce greenhouse gas emissions to address climate change is clear. Our states are already experiencing the harms of climate change, including increased wildfires, more severe droughts and heatwaves, rising seas, and increased frequency and intensity of severe weather events such as hurricanes. Rising temperatures and other impacts of climate change also contribute to increased air pollution, such as particulate matter, ozone, and smog. These impacts are directly harming the health and

¹ Signees are state officials from the following states: California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Rhode Island, Vermont, and Washington.

welfare of residents in our states and causing significant economic damage; we provide more details on these climate impacts and their costs in the attached document.

In order to address the challenge of climate change, we need to significantly reduce carbon pollution and other greenhouse gas emissions, as informed by the best science. Recognition of the need for deep reductions is reflected in the greenhouse gas reduction goals that have been established in many of our states, including commitments to reduce emissions by 75 to 80 percent by 2050.²

Power plants are the largest source of emissions of greenhouse gases in the United States, and therefore it is appropriate for EPA to use its authority under the Clean Air Act to promulgate regulations that will achieve significant emission reductions from these sources as expeditiously as possible.

The costs of inaction are high. The harms from climate change will only continue to grow in the future, and the most vulnerable in our society are at greatest risk. We have an obligation to our children and future generations to take action now to reduce carbon pollution and prevent the worst harms of climate change.

The good news is that our states and others have already demonstrated that it is quite feasible to cost-effectively reduce carbon pollution from the power sector and transition to a cleaner, more efficient electric power system that improves public health and strengthens our economies.

In the absence of comprehensive Congressional action to address climate change, we commend EPA for proposing these regulations under its Clean Air Act authority to regulate greenhouse gases as an air pollutant, as affirmed by the Supreme Court.³ We are particularly appreciative of EPA's unprecedented outreach effort to states and other stakeholders to solicit input in developing this proposal.

The benefits of the proposed rule to families in states across the nation are clear. In addition to reducing carbon emissions, the Clean Power Plan results in a decrease in other pollutants; EPA projects that in 2030 reducing particulate matter and ozone

² See *infra* Section I.C.

³ The Supreme Court held in 2007 that the Clean Air Act requires EPA to regulate greenhouse gas pollution unless the agency determines that such pollution would not endanger public health and welfare. *Massachusetts v. EPA*, 549 U.S. 497 (2007). This general regulatory authority was affirmed this year when the Court partially upheld EPA permitting requirements for greenhouse gas emissions from newly constructed or modified major sources under the Prevention of Significant Deterioration program. *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014). The Court has also previously held that EPA's implementation of Section 111 of the Clean Air Act to regulate greenhouse gases displaces the federal common law right to seek abatement of greenhouse gas emissions from power plants. *American Electric Power Co. v. Connecticut*, 131 S. Ct. 2527 (2011).

pollution will have the effect of avoiding up to 150,000 asthma attacks, 3,300 heart attacks, 6,600 premature deaths, and 490,000 days of missed school for children or missed work for adults.⁴ The proposal would also reduce the emissions of hazardous air pollution, including hydrochloric acid and heavy metals such as mercury, which will improve the health of our rivers and streams, forests, crops and wildlife.⁵

As mentioned above, we support EPA's general approach to identifying a Best System of Emission Reduction (BSER) that recognizes the system-wide strategies that are already being used to achieve carbon pollution reductions from fossil fuel-fired power plants and drive technology improvements in the electricity system. The experience of our states confirms that the best system for reducing carbon pollution includes a combination of improving power plant efficiency, shifting to less carbon-intensive generation among affected sources, and reducing pollution at affected sources through shifts to renewable energy and implementation of demand-side energy efficiency. This combined system represents the best system to reduce carbon pollution from existing power plants when taking into consideration cost, impacts on energy, and other health and environmental impacts, as required by the Clean Air Act.

We note that the overall level of projected power sector carbon pollution reduction—30 percent below 2005 levels by 2030—would represent a significant step toward achieving the emission reductions needed in the United States. This level of reduction alone, however, is insufficient to meet the challenge of climate change, and additional reductions will be required throughout the global economy. The experience of many of our states shows that even greater levels of cost-effective carbon pollution reductions from the power sector are achievable in this timeframe using the system described by EPA.

We also applaud the flexibility that EPA has provided to states, reflecting the federalist framework of the Clean Air Act and Section 111(d) in particular. This will allow states and power companies to use strategies and programs that are already working and to design plans appropriate for their individual and regional circumstances. We particularly commend EPA for including the following important flexibilities:

- the option for state plans to include existing or new renewable portfolio standards, energy efficiency resource standards, and market-based programs to reduce carbon pollution;

⁴ U.S. EPA, Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, Table 4-18 at 4-36 (June 2014), <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602ria-clean-power-plan.pdf>.

⁵ *Id.* at 7-11.

- the option for states to select a mass-based compliance framework;
- the use of multi-year compliance periods; and
- the option for states to implement multi-state plans.

In response to EPA's request for comment, we also suggest a number of ways in which the proposed rule can be clarified and refined. We provide details in the attached document. In summary:

- EPA should maintain the general two-part structure of an interim goal with a 10-year averaging period and a final goal, and allow states to develop their own "glide paths" by which they meet the goals. We encourage EPA to provide states additional flexibility to meet the interim goal through allowing states the options to credit certain reductions achieved prior to 2020 and to begin the interim compliance period before 2020.
- EPA should reflect in the Best System of Emission Reduction the potential for all states to achieve some improvement in emission performance by shifting from existing fossil steam generation to natural gas generation or co-firing or repowering with natural gas, as articulated in the "minimum floor" proposal identified by EPA in the Notice of Data Availability.
- EPA should allow states a range of federally enforceable plan design options. This should include the option of using tradable allowance systems, along with support for integrating existing state carbon markets and other state programs into the federal Clean Power Plan framework while maintaining significant state discretion to operate and improve state programs. EPA should also provide the option of using a "state commitment" approach for "portfolio" state plans, where those commitments are carefully defined, subject to regular reporting, and include a federally enforceable backstop measure on EGUs to secure any reductions that state plan commitments do not deliver.
- EPA should provide guidance on demand-side energy efficiency evaluation, measurement, and verification that encourages full and transparent use of this strategy and ensures that real reductions will be achieved.
- EPA should provide guidance to Regional Administrators to ensure consistent evaluation of state plans across regions.
- EPA should clarify and refine elements of the proposal relating to multi-state collaboration to provide additional support and incentives for these approaches, including flexibility for states to collaborate through submission of both joint and individual plans.

- EPA should clarify that state plans will not be allowed to “double count” reductions, but also allow states to take credit for emission reductions achieved out of state due to in-state energy efficiency or renewable measures as long as the reductions are not double-counted.

Finally, we also attach here earlier comments submitted by many members of this group to EPA in advance of the development of the proposed rule. These earlier comments are consistent with our comments and recommendations here and we request that they be included in the rulemaking record.⁶

We commend EPA on taking this crucial first step in what must be an incremental, long-term plan to reduce emissions from all sectors.

This proposed rule represents the most significant component of our national effort to reduce carbon emissions throughout our economy. It provides an opportunity to harness American ingenuity to be global leaders in the clean energy economy of the future.

Given the scale of needed reductions and the enormous costs of expected climate change impacts, we believe all states have an obligation to implement reasonable measures to reduce carbon emissions. Our states already have extensive experience developing and implementing successful state and regional clean energy and climate programs. We are excited to work with other states to share information and lessons learned from our programs, and to in turn learn from other states, as all states prepare to develop plans for compliance with the Clean Power Plan.

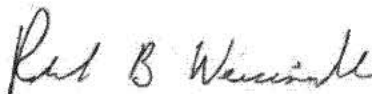
We look forward to continuing to work with EPA to finalize this rule and implement it successfully.

Sincerely,

⁶ States’ Roadmap on Reducing Carbon Pollution (Dec. 16, 2013), http://www.georgetownclimate.org/sites/www.georgetownclimate.org/files/EPA_Submission_from_States-FinalCompl.pdf. *See also* Docket ID EPA-HQ-OAR-2013-0602-0198, Supporting & Related Material, State Environmental Agency leaders from CA, CO, DE, IL, ME, MD, MA, MN, NH, NY, OR, RI, VT, WA, Open Letter to the EPA Administrator Gina McCarthy on Emission Standards Under Clean Air Act Section 111(d) (Dec. 16, 2013), <http://www.regulations.gov/contentStreamer?objectId=090000648173e7e0&disposition=attachment&contentType=pdf>.



Mary D. Nichols
Chair
California Air
Resources Board



Robert B. Weisenmiller
Chair
California Energy
Commission



Michael R. Peevey
President
California Public
Utilities Commission



Robert Klee
Commissioner
Connecticut Department of
Energy and Environmental
Protection



David Small
Secretary
Delaware Department of
Natural Resources and
Environmental Control



Dallas Winslow
Chair
Delaware Public
Service Commission



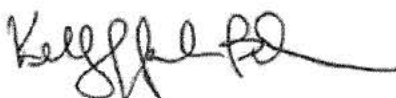
Douglas P. Scott
Chair
Illinois Commerce
Commission



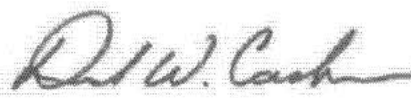
David Littell
Commissioner
Maine Public
Utilities Commission



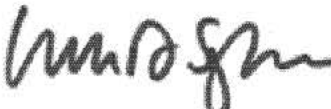
Robert M. Summers
Secretary
Maryland Department
of the Environment



Kelly Speakes-Backman
Commissioner
Maryland Public
Service Commission



David W. Cash
Commissioner
Massachusetts Department
of Environmental
Protection



Mark Sylvia
Undersecretary
Massachusetts Executive
Office of Energy and
Environmental Affairs



John Linc Stine
Commissioner
Minnesota Pollution
Control Agency



Mike Rothman
Commissioner
Minnesota Department
of Commerce



Thomas S. Burack
Commissioner
New Hampshire Department
of Environmental Services



Joseph Martens
Commissioner
New York State Department
of Environmental
Conservation



Audrey Zibelman
Chair
New York State Public
Service Commission



Dick Pederson
Director
Oregon Department of
Environmental Quality



Janet Coit
Director
Rhode Island Department of
Environmental Management



Marion Gold
Commissioner
Rhode Island Office of
Energy Resources



Deborah Markowitz
Secretary
Vermont Agency of
Natural Resources



Maia D. Bellon
Director
Washington Department of
Ecology

**States' Clean Power Plan Implementation Group Comments to EPA
on Carbon Pollution Standards for Existing Power Plants**

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I. Impacts of Greenhouse Gas Pollution on Our States and the Need for Action

I.A. Our States Are Already Experiencing Climate Impacts, with Significant Economic Cost

The United States is already experiencing the impacts of a changing global climate. The National Climate Assessment indicates that the average U.S. temperature has increased by 1.3 to 1.9 degrees Fahrenheit since 1895, and the period from 2001 to 2012 was the warmest decade on record.⁷ This temperature increase is causing observable changes, including reduced ice and snowpack extent and duration, changes in precipitation, and sea-level rise. Our individual states⁸ are already experiencing these impacts, and incurring substantial economic costs responding to climate-related disasters. For example:

Wildfires and forest impacts: Higher temperatures and lower moisture during summers—a projected result of climate change in the U.S.—contribute to increased wildfire severity and extent.⁹ The state of Oregon expects the area burned to increase by 900 square miles per year by the 2040s, 2.5 times the 1980-2006 average.¹⁰ Washington State experienced the largest wildfire in state history in 2014, covering about 400 square miles and destroying an estimated 300 homes.¹¹ Warmer temperatures and a lengthening of the frost-free season are also contributing to increases in insect outbreaks and tree disease outbreaks, which further fuels flammability.¹²

Drought: Higher temperatures and precipitation changes are expected to increase evaporation rates and decrease the extent and duration of snowpack necessary to recharge water supplies, all of which contribute to drought conditions. More intense summer droughts are projected nearly everywhere in the continental U.S., due to longer periods of dry weather and more extreme heat associated with climate change.¹³ California is currently facing an unprecedented drought, expected to cause the loss of

⁷ U.S. Global Change Research Program, *Climate Change Impacts in the United States: The Third National Climate Assessment* 28 (2014), nca2014.globalchange.gov/report [hereinafter U.S. GCRP 2014].

⁸ Signees to this letter include representatives from the state of Vermont. Although Vermont does not possess any sources affected by the proposed Clean Power Plan, the state of Vermont will be directly affected by the regulations: Vermont is already experiencing the harms of climate change and is seeking actively to mitigate greenhouse gas emissions; Vermont participates in a regional effort to reduce emissions from the power sector in the Regional Greenhouse Gas Initiative; and implementation of state plans to comply with the Clean Power Plan in other states will affect Vermont's electricity system.

⁹ U.S. GCRP 2014, *supra* note 7, at 178.

¹⁰ Oregon Department of Environmental Quality, *Oregon's success investing in energy efficiency and renewable energy* (May 2014), http://www.georgetownclimate.org/sites/www.georgetownclimate.org/files/Oregon_StateAchievementFactSheet.pdf.

¹¹ Wayne Havrelly, Longer, hotter Northwest fire seasons are 'new normal,' *USA Today* (Jul. 28, 2014), <http://www.usatoday.com/story/news/nation-now/2014/07/28/northwest-fire-season-longer-hotter/13260757/>.

¹² Climate Impacts Group, University of Washington, *Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers* (Dec. 2013), <http://cses.washington.edu/db/pdf/snoveretalsok816.pdf>.

¹³ U.S. GCRP 2014, *supra* note 7, at 75.

17,000 jobs and over \$2 billion in economic costs to the state's agriculture sector.¹⁴ This year large areas in Oregon and Washington, as well as much of the southwest, have been designated as drought disaster areas by the U.S. Department of Agriculture.¹⁵

Extreme weather events: Heavy rains, flooding, and hurricane activity have increased in recent years, and the intensity and frequency of these events are expected to continue to increase because of climate change.¹⁶ For example, in Vermont, average annual precipitation has increased 5.9 inches since 1960, and almost half of this increase has occurred since 1990. In 2011, heavy rain and wind from Tropical Storm Irene caused devastating flooding in Vermont, causing approximately \$250 million of damage to roads, bridges, and rail lines.¹⁷ Tropical Storm Irene also left 800,000 Connecticut customers without power for up to nine days. This record outage was surpassed only six weeks later when an October snowstorm took out power for 880,000 customers.¹⁸

A year later, Hurricane Sandy hit many of the areas still recovering from Irene. This "superstorm" caused widespread devastation, including 60 deaths in New York, 22 deaths in New Jersey, and 4 deaths in Connecticut.¹⁹ The storm caused catastrophic flooding of communities, knocking out power for more than two million people in New York and 625,000 in Connecticut, damaging major transportation systems, destroying or damaging more than 300,000 homes, and leaving countless families homeless.

Damage from Hurricane Sandy to New York City alone was estimated at \$19 billion, and statewide Sandy cost New York \$32.8 billion in repair and restoration costs and \$9.1 billion in mitigation and prevention costs.²⁰ The estimated cost to Connecticut for the 2011-2012 storms exceeded \$750 million dollars. That figure does not include uninsured losses which could push the losses over \$1 billion dollars.²¹

Extreme rainfall events, storms, and flooding are expected to become more common, threatening states' infrastructure and water quality. Rising sea levels increase the prospect that coastal states will be more vulnerable to these types of storms in the years ahead.

¹⁴ Jim Carlton, California Drought Will Cost \$2.2 Billion in Agriculture Losses This Year, *The Wall Street Journal* (Jul. 15, 2014), <http://online.wsj.com/articles/drought-will-cost-california-2-2-billion-in-losses-costs-this-year-1405452120>.

¹⁵ U.S. Department of Agriculture, Disaster and Drought Information, (Sept. 17, 2014), http://www.usda.gov/wps/portal/usda/usdahome?navid=DISASTER_ASSISTANCE.

¹⁶ U.S. GCRP 2014, *supra* note 7, at 36-37, 41-42.

¹⁷ Vermont Agency of Natural Resources, Tropical Storm Irene By the Numbers, <http://www.anr.state.vt.us/anr/climatechange/irenebythenumbers.html>.

¹⁸ Connecticut Department of Energy and Environmental Protection, 2013 Comprehensive Energy Strategy for Connecticut (Feb. 19, 2013), http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf.

¹⁹ Miguel Llanos, Sandy death toll in US rises to 109; 'there could be more,' Bloomberg warns, *NBC News* (Nov. 2, 2012), http://usnews.nbcnews.com/_news/2012/11/02/14884300-sandy-death-toll-in-us-rises-to-109-there-could-be-more-bloomberg-warns?lite.

²⁰ Per New York State Department of Environmental Conservation staff.

²¹ CT DEEP, *supra* note 18.

Sea-level rise: Coastal states are already confronting the threat of sea-level rise. Global sea levels are projected to rise an additional one to four feet or more by 2100 due to thermal ocean expansion and melting glaciers and ice sheets. An estimated 5 million people in the U.S. live within the area that would be inundated with four feet of sea level rise; that affected area could experience further increased flooding due to climate-related storm surges and land subsidence.²² For example, Massachusetts faces the loss of fourteen acres of land per mile of coast line by 2100 and exacerbated flood damages, as a “10-year flood will have the magnitude of the present 100-year flood.”²³ California is also highly vulnerable to damages from sea-level rise. Based on projections of “medium to medium-high” emissions levels to 2100 resulting in a 1.4 meter sea-level rise, California would be at risk of \$100 billion in property damages and 480,000 people at risk from a 100-year flood event.²⁴ In Maryland, five feet of sea-level rise over the next century could flood 550 square miles of land at high tide, including 60,000 homes and 66 miles of state roads.²⁵

Increased air pollution: Higher air temperatures and increased wildfire smoke are expected to increase particulate matter and ozone, threatening public health. Increased heat, an expected impact of climate change, will increase formation of ground-level ozone, which diminishes lung function and exacerbates asthma. Particulate matter concentrations increase with increased wildfire frequency and severity; inhalation of particulate matter can cause lung and cardiovascular damage.²⁶ A study found that California could experience as many as six to thirty more days per year with ozone concentrations that exceed federal clean-air standards, depending on the extent of increased temperatures. In the southern California region, projected changes in ozone concentrations due to climate change in the year 2050 could increase by 9 to 18 parts per billion. These studies reflect the increased efficiency of ozone production in a warmer climate and the potential for increased biogenic volatile organic compound emissions driven by higher temperatures, problems exacerbated by the emission of other greenhouse gases.²⁷

²² U.S. GCRP 2014, *supra* note 7, at 44-45.

²³ *Massachusetts v. EPA*, 549 U.S. 497 n.20 (2007) (citing Kirshen Decl. ¶ 10, at 198).

²⁴ Matthew Heberger et al., California Climate Change Center, The Impacts Of Sea-Level Rise On The California Coast 2-3 (May 2009), <http://pacinst.org/wp-content/uploads/sites/21/2014/04/sea-level-rise.pdf> (cited by U.S. EPA, 74 Fed. Reg. at 32764 (July 8, 2009)).

²⁵ Maryland Department of the Environment, Maryland’s Greenhouse Gas Reduction Plan, 37 (Oct. 2013), http://climatechange.maryland.gov/site/assets/files/1392/mde_ggrp_report.pdf.

²⁶ U.S. GCRP 2014, *supra* note 7, at 220-23.

²⁷ Michael J. Kleeman et al., Climate Change Impact on Air Quality in California: Report to the California Air Resources Board (June 2010), www.arb.ca.gov/research/apr/past/04-349.pdf.

I.B. In Contrast, Our States Have Found that Taking Action to Reduce Carbon Pollution Can Provide Economic Benefits

Failure to act to reduce greenhouse gas emissions will be costly. In contrast, action to reduce carbon emissions generates economic benefits, as has been shown in each of our states. For example:

- California's Renewable Portfolio Standard (RPS) is projected to generate \$60 billion in the California economy and create up to 235,000 jobs.
- By 2015, Illinois' RPS is projected to bring nearly \$6 billion in new investment and create over 5,000 jobs, while its Energy Portfolio Standard is projected to save the average household close to \$100 a year, to stimulate nearly \$5 billion in economic activity, and to create over 16,000 new jobs.
- An independent study found that Maryland's portfolio of climate and energy programs would generate \$1.6 billion for the state's economy and support 37,000 jobs.²⁸
- Investments in energy savings and renewable energy generation from Oregon's public purpose charge have produced the equivalent of 2,200 full-time jobs and added \$2.7 billion to the local economy, while also saving utility customers \$1.3 billion on their energy bills through reduced energy demand.
- In Massachusetts, surveys by the Clean Energy Center show an 11.8 percent increase in clean energy jobs in 2013; clean energy employment has grown between 6 and 12 percent annually for the last five years. Nearly 80,000 employees are working in clean energy throughout the Commonwealth.²⁹
- Through 2012, New York achieved more than \$5.8 billion in cumulative energy bill savings through NYSEERDA's System Benefits Charge and Energy Efficiency Portfolio Standard efficiency programs.³⁰
- Washington voters established targets for new renewable energy generation in 2006, helping drive more than \$7 billion in investment in Washington's clean energy economy.

As these examples show, our states have found that there are significant economic benefits to reducing carbon pollution from the power sector.

²⁸ MDE, *supra* note 25.

²⁹ Massachusetts Clean Energy Center, 2013 Massachusetts Clean Energy Industry Report, http://images.masscec.com/uploads/attachments/2013/09/MassCEC_2013_IndustryRpt.pdf.

³⁰ Per New York State Department of Environmental Protection staff.

We also note that many of our states have found that every dollar saved through investments in energy efficiency creates net benefits to the economy, and EPA's economic analysis should fully consider the net benefits of energy efficiency measures that would be implemented to comply with the rule.

I.C. Level of Reduction Needed to Address Climate Change

Scientific studies show that deep reductions in carbon emissions are needed to avoid the most severe impacts of climate change. In the 2009 Copenhagen Accord, the world's governments reaffirmed that in order to "prevent dangerous anthropogenic interference with the climate system,"³¹ scientific consensus indicates that "the increase in global temperature should be below 2 degrees Celsius" (3.6 degrees Fahrenheit).³² The 2007 Intergovernmental Panel on Climate Change Fourth Assessment Report concluded that in order to achieve that goal and stabilize global CO₂ concentrations, 2050 greenhouse gas emissions from industrialized nations must be at least 80 percent lower than in 1990.³³ The recently released Fifth Assessment Report indicates that an emissions level near or below zero will be necessary by 2100.³⁴

Many of our states have already made substantial commitments to achieve deep reductions in carbon emissions, from the power sector and economy-wide. The long-term greenhouse gas emissions reduction targets set by states in our clean energy and climate action plans or established by our state legislatures reflect the level of ambition that is achievable. For example, our state greenhouse gas reduction commitments include the following:

- California: 80 percent below 1990 levels by 2050³⁵
- Connecticut: 80 percent below 2001 levels by 2050³⁶
- Maine: 75-80 percent below 2003 levels long term ("may be required")³⁷

³¹ United Nations Framework Convention on Climate Change, Article 2: Objective, http://unfccc.int/essential_background/convention/background/items/1353.php.

³² United Nations Framework Convention on Climate Change, Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009, 4 (2009), http://unfccc.int/documentation/documents/advanced_search/items/6911.php?preref=600005735#beg.

³³ IPCC, Climate Change 2007: Mitigation, Policies, Instruments and Co-operative Agreements, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter13.pdf>.

³⁴ The Fifth IPCC report does not provide a specific target for developed countries for 2050, but says that a 40 to 70 percent reduction in global greenhouse gas emissions will be necessary by 2050 for all countries relative to 2010 emissions. IPCC, Climate Change 2014: Synthesis Report 39 (Nov. 1, 2014), http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf.

³⁵ California Executive Order S-3-05 (June 1, 2005), <http://gov.ca.gov/news.php?id=1861>.

³⁶ Connecticut Public Act No. 08-98, An Act Concerning Connecticut Global Warming Solutions (June 2, 2008), <http://www.cga.ct.gov/2008/ACT/PA/2008PA-00098-R00HB-05600-PA.htm>.

- Massachusetts: 80 percent below 1990 levels by 2050³⁸
- Minnesota: 80 percent below 2005 levels by 2050³⁹
- New Hampshire: 80 percent below 1990 levels by 2050⁴⁰
- Oregon: 75 percent below 1990 levels by 2050⁴¹
- Vermont: 75 percent below 1990 levels by 2050 (“if practicable”)⁴²

The electric power sector is responsible for about one-third of national greenhouse gas emissions and approximately 40 percent of CO₂ emissions, making it the single largest sector for emissions in the United States. Moreover, the fact that these emissions are produced by a small number of sources relative to other sectors (e.g., transportation), and that there are a large number of cost-effective opportunities to reduce emissions, means that it is critical that we achieve significant reductions from the power sector in order to address the challenge of climate change.

I.D. Overall Level of Reduction Not Sufficient to Address Climate Change

Given the pressing challenge of climate change, we applaud EPA for proposing a rule that will place the United States on a path to achieving meaningful reductions in carbon pollution.

EPA’s proposal represents the most significant component of our national effort to reduce carbon emissions throughout our economy. The proposal alone, however is insufficient to achieve the level of reductions necessary to avoid the most dangerous impacts of climate change. Although it is a crucial first step, the 30 percent reduction in power sector carbon emissions below 2005 levels by 2030 that the Clean Power Plan is projected to achieve falls short of the progress needed to reach an 80 percent reduction in economy-wide emissions by 2050.

³⁷ Public Law of the State of Maine, Me. Rev. Stat. Ann. tit. 38 § 576 (Sept. 13, 2003), <http://www.mainelegislature.org/ros/LOM/lom121st/5pub201-250/pub201-250-44.htm>.

³⁸ Massachusetts Climate Protection and Green Economy Act (Aug. 7, 2008), <https://malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter298>.

³⁹ Minnesota Next Generation Energy Act of 2007, Minn. Stat. § 216C.05 (2006), <https://www.revisor.mn.gov/bin/bldbill.php?bill=S0145.2.html&session=ls85>.

⁴⁰ New Hampshire Climate Change Policy Task Force, The New Hampshire Climate Action Plan (Mar. 2009), http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/documents/nhcap_final.pdf.

⁴¹ Oregon House Bill 3543: Global Warming Actions (2007), <https://olis.leg.state.or.us/liz/2007R1/Downloads/MeasureDocument/HB3543>.

⁴² Vermont H.R. 6: House resolution urging action on climate change-related policies (Feb. 3, 2011), <http://www.leg.state.vt.us/docs/2012/resolutn/HR0006.pdf>; Vermont Executive Order No. 15-12: Governor’s Climate Cabinet and State Agency Climate Action Plan (Dec. 28, 2012), http://www.anr.state.vt.us/anr/climatechange/Pubs/ClimateCabinetExecOrder_15-12.pdf.

II. Support for EPA's Approach to Setting the Emission Guideline

II.A. We Support EPA's Identification of the Best System of Emission Reduction

We support EPA's general approach to setting the emission guideline in the proposed rule and to determining the Best System of Emission Reduction (BSER).⁴³

As described above, many of our states have already achieved significant reductions in carbon pollution from the power system. Based on our state experience, we agree with EPA that the "best" system for reducing carbon pollution from fossil fuel-fired electricity generating units is a combination of strategies including improving efficiency (i.e., "heat-rate") at affected power plants, shifting to less carbon-intensive generation among affected power plants, and reducing pollution at affected power plants through expanded deployment of low- and zero- carbon generation and demand-side energy efficiency. We agree with EPA that this system reflects the "best" system when taking into account the criteria required by law, including technological feasibility, the amount of emission reductions the system would generate, associated costs, energy impacts, and that Section 111 is designed to promote the development and implementation of technology.⁴⁴

This system reflects the reality of the electric grid, where interconnected energy generation resources (and energy efficiency resources) are managed dynamically to ensure that energy demand is met moment-to-moment. We have long relied on the interconnected nature of the power grid to provide opportunities to reduce air pollution from fossil fuel-fired power plants. When renewable energy resources are added to the grid, they displace existing generation or avoid additional generation from fossil fuel-fired plants; emissions go down or are avoided. When coal plants run less, energy demand is met by increased dispatch of natural gas plants and zero-carbon resources. When we have invested in demand-side energy efficiency, power demand goes down and emissions go down or are avoided as well. This is the system of emission reduction that we have successfully deployed to reduce pollution from power generation, including carbon pollution.

Our state programs and experiences support and affirm the Administrator's determination that such a system and its constituent elements have been adequately demonstrated, are technologically feasible, and work in practice to cost-effectively reduce carbon pollution from power plants while maintaining the reliability of the electric system. On average, our states have reduced carbon pollution from the power

⁴³ In response to EPA's request for comment on the proposed BSER. 79 Fed. Reg. at 43835. We note that this letter does not address the proposed scoping of these different building blocks and the various levels of implementation that EPA proposed and applied to individual states; many of our states will comment on those separately.

⁴⁴ 42 U.S.C. § 7411; 79 Fed. Reg. at 43879.

sector by 23 percent from 2005 to 2012,⁴⁵ and achieved a 22 percent improvement in the carbon intensity of their power sector.⁴⁶ This reduction reflects the effectiveness of this system and its individual components.

We provide more detail on how our states have demonstrated these constituent elements and the system as a whole here:

Heat Rate Improvements (Building Block 1)

Electricity generators in our states have already demonstrated that it is possible to employ best operating practices and upgrade equipment to improve the efficiency of fossil fuel-fired electric generating units (EGUs) and reduce emissions.

Such improvements have been driven by a number of state policies, including the Regional Greenhouse Gas Initiative (RGGI). Independent analysis has shown that coal-fired EGUs have historically been capable of making improvements in heat rate to respond to increases in operating costs (i.e., increases in the cost of fuel).⁴⁷ In RGGI, the requirement for units to hold allowances for each ton of CO₂ emitted creates a similar financial incentive for units subject to the program to improve their efficiency, and some coal-fired power plants in the region have performed such upgrades in recent years. For example, the Public Service Company of New Hampshire upgraded a coal-fired unit at Merrimack Station by installing new energy-efficient turbine; the upgrade is estimated to avoid up to 150,000 tons of CO₂ emissions per year.⁴⁸ In another example, Minnesota's Metro Emission Reduction Project encourages utilities to make voluntary emissions reductions at qualifying units. Xcel Energy completed a project under this program from 2007 to 2009 that included reducing carbon emissions from three Twin Cities-area power projects by 21 percent. At one facility, reductions were achieved

⁴⁵ Computed from U.S. Energy Information Administration data for total electric power sector emissions in CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA. EIA, U.S. Electric Power Industry Estimated Emissions by State (EIA-767, EIA-906, EIA-920, and EIA-923).

⁴⁶ Computed from U.S. Energy Information Administration data for total electric power sector generation and emissions in CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA. Electricity generation data is from EIA, Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923). Carbon pollution data is from EIA, U.S. Electric Power Industry Estimated Emissions by State, (EIA-767, EIA-906, EIA-920, and EIA-923).

⁴⁷ Joshua Linn, Erin Mastrangelo, and Dallas Burtraw, *Regulating Greenhouse Gases from Coal Power Plants under the Clean Air Act*, 1 J. ASSOC. OF ENV'T'L & RESOURCE ECON. 93, 126 (2014) (finding historic data shows improvements in heat rates of U.S. coal-fired EGUs in response to coal-price increases); see also Denny Ellerman, *Note on the Seemingly Indefinite Extension of Power Plant Lives*, A Panel Contribution, 19(2) ENERGY J. 129 (1998) (noting that existing power plants are being improved as they age and therefore not being replaced at what earlier would have been considered the end of their useful lives).

⁴⁸ Northeast Utilities, *Our Environmental Performance*, http://www.nu.com/csrr/pdf/NUCSRR_our_performance.pdf.

through rehabilitation of an existing coal unit with a new turbine, upgraded steam generator, and improved emissions control equipment.⁴⁹

Dispatch Changes Among Affected EGUs (Building Block 2)

Our states have experienced increased utilization of more efficient natural gas combined-cycle (NGCC) units while experiencing decreased generation at the most carbon-intensive fossil-fired EGUs. For our group of states, electricity generation from natural gas-fired EGUs increased 37 percent between 2005 and 2012, while generation from more carbon-intensive coal-fired EGUs has decreased 36 percent over the same period.⁵⁰ This shift to less carbon-intensive fossil fuel-fired generation was a major factor in the 23 percent reduction in carbon emissions achieved by our states over the same period of time, as noted above.

EPA proposes that increasing utilization of existing NGCC units is a component of the Best System of Emission Reduction, and this has been demonstrated by our state experience. NGCC units that were operating in our states in 2005 increased their generation 21 percent by 2012.⁵¹ This significant increase in utilization at existing NGCCs is a significant component of the system our states have collectively used to achieve emission reductions and improve emissions intensity.

EPA also takes comment on whether the BSER should also reflect potential reductions in emissions from affected sources because of a shift in dispatch to new NGCCs, as well as opportunities to reduce the carbon-intensity of coal-fired EGUs through co-firing or repowering with natural gas.

A shift in dispatch to new NGCC units has also been a significant component of the system our states have used to achieve emission reductions and emission intensity improvements. Between 2005 and 2012—the same period that our states saw significant decreases in coal-fired electricity generation, decreases in CO₂ emissions, and improvements in emission rates—our states experienced a collective increase of 12,584

⁴⁹ Minnesota Public Utility Commission, Report to the Legislature on Emission Reduction Projects Under Minnesota Statutes 216B.1692 (2008), http://www.puc.state.mn.us/portal/groups/public/documents/pdf_files/000661.pdf; Xcel Energy, Minnesota Metro Emissions Reduction Project, http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/MN_MERP.

⁵⁰ Computed from U.S. Energy Information Administration data for CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA. EIA, Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923).

⁵¹ Computed from U.S. Energy Information Administration data for CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA for NGCC units that were in operation in 2005 and are listed as “likely covered fossil sources” in EPA’s TSD Goal Computation Appendix 7. 2012 nameplate capacity, generation, and capacity factor data come from EIA 860 and EIA 923. 2005 and 2012 generation data comes from EIA 906 and EIA 920.

megawatts of NGCC nameplate capacity. In 2012, NGCC units that began operation after 2005 contributed an additional 50 million megawatt hours of generation.⁵²

Similarly, a number of coal-fired EGUs in our states have already reduced their carbon pollution rate by co-firing with natural gas.⁵³ This demonstrates that in some circumstances, such strategies are cost-effective under current market conditions.

Within the group of states participating in RGGI, the overall shift in generation from carbon-intensive EGUs to more efficient and less carbon-intensive NGCC units is at least partially attributable to the emission budget trading program. Since the program sets a price on carbon emissions through the auction of emission allowances, NGCC units incur lower emission allowance costs relative to coal-fired generation units and therefore are called on to operate more often.

There are other examples of state programs that have promoted a shift to NGCC generation and the resulting reduction in CO₂ emissions:

- In Delaware, energy providers NRG and Calpine have used a state grant program to replace coal-fired generation units with combined cycle natural gas plants; the state now has only one remaining coal-fired generating unit.⁵⁴ Delaware reduced carbon pollution from the power sector by over 27 percent from 2005 to 2012, while increasing natural gas generation by over 300 percent and decreasing coal generation by 70 percent.⁵⁵
- California's in-state fossil generation is almost entirely natural gas-fired,⁵⁶ and the state is rapidly phasing out imported power from higher-emitting coal-fired power plants through implementation of an Emissions Performance Standard.⁵⁷ These coal imports represent only about 7.5 percent of California's energy portfolio, and are expected to continue to decline through 2020.⁵⁸

⁵² Computed from U.S. Energy Information Administration data for CA, CT, DE, IL, ME, MD, MA, MN, NY, NH, OR, RI, VT, WA for NGCC units that were in operation in 2005 and 2012 and are listed as "likely covered fossil sources" in EPA's TSD Goal Computation Appendix 7. 2012 nameplate capacity, generation, and capacity factor data come from EIA 860 and EIA 923. 2005 and 2012 generation data comes from EIA 906 and EIA 920.

⁵³ Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers 19 (2014) (noting conversion of two Laskin Energy Center units underway in Minnesota and two Edge Moor units completed in Delaware).

⁵⁴ Doug Rainey, Officials mark conversion of Dover power plant to natural gas, Delaware Business Daily (Aug. 1, 2013), <http://delawarebusinessdaily.com/2013/08/officials-mark-conversion-of-dover-power-plant-to-natural-gas/>.

⁵⁵ U.S. Energy Information Administration, Net Generation by State by Type of Producer by Energy Source: 1990-2012, State Historical Tables EIA-906, EIA-920, and EIA-923, <http://www.eia.gov/electricity/data/state/>.

⁵⁶ California Energy Commission, Tracking Progress: Installed Capacity (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/installed_capacity.pdf.

⁵⁷ Cal. Pub. Util. Code §§ 8340-8341, and implementing regulations.

⁵⁸ California Energy Commission, Tracking Progress: Current and Expected Energy from Coal in California (Nov. 6, 2014), http://www.energy.ca.gov/renewables/tracking_progress/documents/current_expected_energy_from_coal.pdf.

Expanding Less Carbon-Intensive Generating Capacity (Building Block 3)

In most of our states, emissions from fossil fuel-fired EGUs have decreased while renewable energy generation has increased, in large part due to our states' renewable energy policies. States across the country are successfully reducing greenhouse gas emissions and driving technological development by integrating renewable sources into the grid. At least 30 states have renewable portfolio standards or alternative energy portfolio standards.⁵⁹ The experience of our states, confirmed by independent analyses,⁶⁰ indicates that sufficiently ambitious renewable energy policies can achieve significant carbon pollution reductions or avoid pollution increases by replacing generation from fossil fuel-fired sources or avoiding increased generation. In addition, these policies can spur renewable energy innovation and deployment and promote long-term change toward a cleaner electricity system.

Examples of how our states have cost-effectively reduced emissions from fossil-fuel fired EGUs through increases in renewable generation include the following:

- California has an aggressive RPS, requiring that 33 percent of state power procurement come from renewable sources by 2020.⁶¹ The measure avoided emissions of 3.5 million metric tons of CO₂ equivalent in 2011 alone.⁶² With more than 20 percent of the state's power already coming from renewable sources, California is well on its way to meeting that target, and is considering ways to further develop renewable power. California has 20,500 megawatts of installed renewable capacity, more than doubling its installed capacity since 2002.⁶³ In 2012, California served about 22 percent of retail energy sales with renewable energy.⁶⁴ California has demonstrated that replacing carbon-intensive generation

⁵⁹ Center for Climate and Energy Solutions, Renewable and Alternative Energy Portfolio Standards, <http://www.c2es.org/node/9340>.

⁶⁰ See e.g., Bryan K. Mignone et al., Cost-effectiveness and Economic Incidence of a Clean Energy Standard, *Economics of Energy and Environmental Policy*, Volume 1, Number 3 (2012); Elizabeth Doris and Rachel Gelman, National Renewable Energy Laboratory, *State of the States 2010: The Role of Policy in Clean Energy Market Transformation* (2011); Sanya Carley, *State Renewable Energy Electricity Policies: An Empirical Evaluation of Effectiveness*, 37 *Energy Policy* 3071–3081 (2009).

⁶¹ See generally California Public Utility Commission, RPS Program Overview, <http://www.cpuc.ca.gov/PUC/energy/Renewables/overview.htm>.

⁶² California Environmental Protection Agency, State Agency Greenhouse Gas Reduction Report Card 10, 16 (2013), http://www.climatechange.ca.gov/climate_action_team/reports/2013_CalEPA_Report_Card.pdf.

⁶³ California Energy Commission, Tracking Progress: Renewable Energy (Aug. 19, 2014), http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf.

⁶⁴ *Id.*

with renewable fuels is economically beneficial and highly effective at reducing greenhouse gas emissions—the RPS is projected to generate \$60 billion and create up to 235,000 jobs.⁶⁵

Nuclear generation has also been an important component in some of our states' strategies to reduce carbon emissions by continuing to meet a substantial portion of electricity demand with carbon-free generation. For example, in 2012 nuclear-powered generation comprised 48 percent of generation in Illinois, 47 percent in Connecticut, 36 percent in Maryland, and 30 percent in New York.⁶⁶ We note that if some amount of at-risk nuclear generation is discontinued, as projected by the U.S. Energy Information Administration,⁶⁷ then emissions or emission rates would be likely to increase unless the lost generation capacity was replaced entirely with non-emitting resources or avoided through demand-side energy efficiency.

Demand Side Energy Efficiency (Building Block 4)

Our states have a record of successfully reducing emissions through the use of demand-side energy efficiency measures. State energy efficiency programs cost-effectively reduce carbon pollution emissions or avoid pollution increases by reducing demand for generation, while also lowering energy costs for consumers.

Examples of these programs include the following:

- Maryland has achieved a 14.6 percent reduction in peak electricity demand from a 2007 baseline—equivalent to avoiding one coal power plant—and has established a goal of reaching a 15 percent reduction in per capita energy consumption by 2015.⁶⁸ Implementation of EmPOWER Maryland has offset 1.3 million metric tons of CO₂ emissions.⁶⁹ The program has funded measures that will reduce ratepayer electricity use by more than 2 million MWh per year and save \$250 million annually.⁷⁰ Savings are projected to continue for years, with currently existing measures saving ratepayers \$3.7 billion over their useful life.⁷¹

⁶⁵ California Office of Senate Floor Analyses, Bill Analysis for 2011 Senate Bill 2X1 at 10 (2011), http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_cfa_20110223_155225_sen_floor.html.

⁶⁶ U.S. EIA, Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923).

⁶⁷ U.S. EIA, Annual Energy Outlook 2014, Implications of Accelerated Power Plant Retirements, http://www.eia.gov/forecasts/aeo/power_plant.cfm (noting that AEO 2014 analysis projects 6 GW of generic nuclear plant retirements due to economic challenges 2012-2019, not including six nuclear plant closures already announced).

⁶⁸ Per Maryland Energy Administration staff.

⁶⁹ MDE, *supra* note 25.

⁷⁰ Maryland Energy Administration, EmPOWER Maryland Planning, <http://energy.maryland.gov/empower3/>.

⁷¹ *Id.*

- Massachusetts projects that its investment in energy efficiency from 2005 through 2015 will reduce the state's electricity demand by 17.1 percent, resulting in a total annual reduction of 3 million tons of CO₂ in 2015.⁷²

Our states have also successfully tailored these efficiency programs to reach rural consumers, residents of low-income housing, and other under-served constituencies; examples of such programs include:

- The Massachusetts statewide energy efficiency program covers low-income residents that live in both single and multi-family homes, as well as new construction of low-income housing. In 2013, the low-income program reported over \$33 million in electric benefits and over \$92 million in benefits from all energy sources.⁷³ In addition, the Efficiency Neighborhoods+ initiative, which began in 2013, will provide significant energy-saving benefits to low- and moderate-income residents in designated urban neighborhoods, often with older housing stock.⁷⁴
- Minnesota's Conservation Improvement Program (CIP), which set energy efficiency goals for utilities, includes a requirement that utilities spend a minimum of 1.5 to 2 percent of annual gross operating revenues on efficiency programs; at least 0.2 percent must be spent on programs to serve low-income customers.⁷⁵
- Vermont's Manufactured Housing Innovation Project is a pilot project to develop new, energy-efficient manufactured homes to respond to the loss of homes during Tropical Storm Irene and to increase the supply of quality affordable housing. Using advanced energy efficiency technology, these homes are projected to use only 29 percent as much energy as a typical mobile home, minimizing monthly energy costs and making the homes more affordable overall.⁷⁶

⁷² NESCAUM, States' Perspectives on EPA's Roadmap to Incorporate Energy Efficiency/Renewable Energy in NAAQS State Implementation Plans: Three Case Studies 28 (May 22, 2014), <http://www.nescaum.org/documents/nescaum-final-rept-to-epa-ee-in-naaqs-sip-roadmap-case-studies-20140522.pdf>.

⁷³ Massachusetts Energy Efficiency Advisory Council, Statewide Electric 2013 Plan Year Report Data Tables, <http://ma-eeac.org/wordpress/wp-content/uploads/Statewide-Electric-2013-Plan-Year-Report-Data-Tables.xlsx>.

⁷⁴ 2012 Report of the Massachusetts Energy Efficiency Advisory Council 21 (Nov. 13), <http://www.mass.gov/eea/docs/doer/energy-efficiency/ma-advisory-council-2012-report.pdf>.

⁷⁵ Minnesota Department of Commerce, How CIP Works, <http://mn.gov/commerce/energy/topics/conservation/How-CIP-Works.jsp>.

⁷⁶ Vermont Housing & Conservation Board, Manufactured Housing Innovation Project, <http://www.vhcb.org/mhip/>; see also Vermont Housing & Conservation Board, Manufactured Housing Innovation Project Report (Mar. 2013), http://www.vhcb.org/mhip/pdfs/manufactured_housing_innovation_project-sm.pdf.

At least six⁷⁷ of our states had achieved incremental annual savings of greater than 1.0 percent of retail sales in 2012 (ME, VT, CA, CT, MN, and OR), and two had achieved savings rates of at least 1.5 percent (ME and VT). Seven of our states have policies in place that require incremental savings of 1.5 percent of retail sales on or before 2020 (IL, MA, MN, NY, RI, VT, and WA).⁷⁸

A Combined Approach Yields the Best System of Emission Reduction

As our states have demonstrated, significant carbon pollution reductions can be achieved cost-effectively while maintaining electric reliability—and while providing economic, public health, and jobs benefits—using the system that combines the approaches detailed above and that EPA has identified as the BSER.

Examples of how our states have achieved significant carbon pollution reductions using this system include:

- The nine states participating in RGGI have together reduced carbon pollution from power plants in the region by over 40 percent from 2005 to 2012.⁷⁹ The new RGGI cap⁸⁰ of approximately 78 million tons of CO₂ emissions in 2020 is more than 50 percent below 2005 levels. This reduction has resulted largely from the implementation of the combined elements of the proposed BSER, and has been achieved at a low cost and with significant benefits. An independent study found that the RGGI states realized \$1.6 billion in net benefits from the first three years of the program's operation, in large part due to the energy efficiency investments that have reduced consumer electricity spending and increased economic activity.⁸¹ The same study also found that the region would see a net increase of 16,000 jobs due to these energy efficiency investments and other auction revenue spending from the first three years of the program.⁸² The RGGI program has led to investments by power companies to make existing units more efficient, shifts across the electricity system to greater use of cleaner fossil-fuel generation

⁷⁷ We note that EPA's reliance on EIA Form 861 may result in undercounting of historical energy efficiency savings for some states.

⁷⁸ U.S. EPA, Technical Support Document: GHG Abatement Measures 5-33 (June 2014), <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-ghg-abatement-measures>.

⁷⁹ Regional Greenhouse Gas Initiative, Report on Emission Reduction Efforts of the States Participating in the Regional Greenhouse Gas Initiative and Recommendations for Guidelines under Section 111(d) of the Clean Air Act 1 (2013), http://www.rggi.org/docs/RGGI_States_111d_Letter_Comments.pdf.

⁸⁰ RGGI establishes an overall emissions cap on the power sector. In 2013, the participating RGGI states agreed to reduce the emissions cap by 45 percent in 2014. Regional Greenhouse Gas Initiative, Program Review, <http://www.rggi.org/design/overview/cap>.

⁸¹ The Analysis Group, The Economic Impacts of the Regional Greenhouse Gas Initiative 33 (2011), http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf.

⁸² Jobs are "job years," or one job sustained for one year. *Id.*

sources, replacement of fossil-fuel generation with increased renewable energy, and reduction of electricity load growth through demand-side energy efficiency strategies.

- Minnesota's clean energy and emissions reduction programs, which employ the strategies of all four BSER building blocks, have helped the state reduce power sector emissions by 28 percent from 2005 to 2012.⁸³ As mentioned previously, the Minnesota Metro Emissions Reduction Project, completed by Xcel Energy from 2007 to 2009, reduced carbon emissions from three Twin Cities-area power projects by 21 percent through the rehabilitation of an existing coal unit and the replacement of two coal facilities with highly efficient NGCC units.⁸⁴ The 2007 Next Generation Initiative set statewide greenhouse gas reduction goals and established the state's Renewable Energy Standard (RES) and Conservation Improvement Program (CIP) for energy efficiency.⁸⁵ Minnesota's RES requires utilities to provide 25 percent of their power from renewables by 2025.⁸⁶ Minnesota has seen a dramatic increase in renewable resources, growing from 5.8 percent of the state's electricity generation in 2000 to 20 percent in 2014.⁸⁷ All Minnesota utilities have met their 2012 RES goals and most ratepayers are benefitting from lower costs.⁸⁸ The CIP set a 1.5 percent energy savings goal for utilities that operate in Minnesota; the statutes also include requirements for how utilities reinvest their CIP funds, including renewable and distributed generation projects and programs serving low income customers.⁸⁹ The 2013 Minnesota Solar Energy Standard establishes for certain utilities a standard to obtain 1.5 percent of retail electric sales from solar energy by 2020, and it creates

⁸³ U.S. Energy Information Administration, U.S. Electric Power Industry Estimated Emissions by State: 1990-2012, State Historical Tables EIA-767, EIA-906, EIA-920, and EIA-923 (May 2014), <http://www.eia.gov/electricity/data/state/> (accessed via the Georgetown Climate Center State Energy Analysis Tool, <http://www.georgetownclimate.org/SEAtool>).

⁸⁴ Minnesota Public Utility Commission, Report to the Legislature on Emission Reduction Projects Under Minnesota Statutes 216B.1692 (2008), http://www.puc.state.mn.us/portal/groups/public/documents/pdf_files/000661.pdf; Minnesota Metro Emissions Reduction Project, Xcel Energy, http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/MN_MERP

⁸⁵ Minnesota Department of Commerce, Minnesota's Next Generation Energy Initiative, <http://mn.gov/commerce/energy/images/SummaryNext%20Generation%20Energy%20Initiative.pdf>.

⁸⁶ Minn. Stat. 216B.1691 (2013); *see also* DSIRE: Database for State Incentives for Renewable and Efficiency, Minnesota, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MN14R. Xcel Energy, the state's largest utility, must achieve 30 percent from renewables by 2020, one quarter of which must be met with wind.

⁸⁷ Minnesota Office of the Governor Blog, "Minnesota: Gaining Jobs" (July 14, 2014) Available <http://mn.gov/governor/blog/the-office-of-the-governor-blog-entry-detail.jsp?id=102-136769>

⁸⁸ Minnesota Department of Commerce, Progress on Compliance by Electric Utilities with the Minnesota Renewable Energy Objective and the Renewable Energy Standard 3, 9 (2013), <http://mn.gov/commerce/energy/images/2013RESLegReport.pdf>.

⁸⁹ Minnesota Department of Commerce, How CIP Works, <http://mn.gov/commerce/energy/topics/conservation/How-CIP-Works.jsp>.

a goal of obtaining 10 percent of the entire state's retail electricity sales from solar power by 2030.

- California has mounted a comprehensive effort to reduce greenhouse gas emissions, reflecting its commitments to cut carbon pollution to 1990 levels by 2020⁹⁰ and by 80 percent below those levels by 2050.⁹¹ To achieve these goals, California has implemented an economy-wide portfolio of policies, many under the authority of AB 32, California's Global Warming Solutions Act.⁹² By 2025, California expects to cut power sector emissions by 25 percent from 2005 levels, and the state is employing the BSER building blocks in achieving those targets.⁹³ As mentioned previously, California has shifted in-state fossil generation almost entirely to natural gas, and is rapidly phasing out imported power from coal-fired power plants.⁹⁴ Also discussed above, California has an ambitious RPS of 33 percent that is projected to generate \$60 billion and create up to 235,000 jobs.⁹⁵ In addition, California is a leader in energy efficiency, which is the first resource procured under California's loading order.⁹⁶ California has decoupled investor-owned utility profits from sales and offered investor-owned utilities the opportunity to profit from efficiency, creating strong incentives to pursue these savings.⁹⁷

The BSER as determined by EPA reflects that individual generating units do not operate independently, but are instead part of a system of highly interdependent sources whose aggregate emissions are dependent on system management. States, electricity system operators, and power companies are achieving carbon pollution reductions from fossil fuel-fired power plants by shifting the grid as a whole away from high-carbon power sources. Our on-the-ground experiences demonstrate that a combined approach using all of the strategies reflected in EPA's four building blocks is the most cost-effective way to achieve reductions from the energy sector.

⁹⁰ Cal. Public Health and Safety Code § 38550.

⁹¹ Cal. Exec. Order S-3-05 (June 1, 2005).

⁹² See generally Cal. Public Health and Safety Code §§ 38550 *et seq.*

⁹³ California Air Resources Board analysis.

⁹⁴ California Energy Commission, Tracking Progress: Installed Capacity (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/installed_capacity.pdf; Cal. Energy Commission, Tracking Progress: Current and Expected Energy from Coal in California (Nov. 6, 2014), http://www.energy.ca.gov/renewables/tracking_progress/documents/current_expected_energy_from_coal.pdf.

⁹⁵ California Office of Senate Floor Analyses, Bill Analysis for 2011 Senate Bill 2X1 at 10 (2011), http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_cfa_20110223_155225_sen_floor.html.

⁹⁶ California Energy Commission, Implementing California's Loading Order for Electricity Resources (2004), <http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF>.

⁹⁷ See State Energy Efficiency Database: California, American Council for an Energy-Efficient Economy, <http://aceee.org/sector/state-policy/california>.

II.B. A More Limited System of Emission Reduction Would Not be the Best System

In its proposal, EPA invites comment on a BSER composed only of heat-rate improvements to coal-fired EGUs (building block 1) and dispatch to existing combined-cycle natural gas EGUs (building block 2).⁹⁸ A system composed only of these two building blocks would provide less overall opportunity for carbon pollution reduction at a higher cost. As state experience has shown, reducing demand for fossil generation or providing alternative, cleaner sources of supply achieves emissions reductions far beyond the level that can be achieved by improving the operations of individual fossil plants and shifting to natural gas. Reductions from demand-side energy efficiency and renewable energy are also among the most cost-effective reductions. A more limited system would not promote the most cost-effective carbon reducing improvements to the power sector, and therefore cannot be considered the best system of emission reduction.

Furthermore, in determining the best system of emission reduction, EPA is directed to consider that Section 111 is designed to promote the development and implementation of technology. Including in the BSER the opportunities available throughout the electricity system to reduce emissions from affected sources will promote technological advancements throughout the sector that will drive further carbon reductions. A system limited to only building blocks 1 and 2 would exclusively promote improvements of fossil fuel-fired technologies, but would not promote technological improvements or increases in deployment of zero-carbon generation or advanced technologies to reduce energy demand. It is these latter elements of the system that will be most critical to achieving the long-term carbon pollution reductions in the power system necessary to address the challenge of climate change.

Our state experience demonstrates that the combination of heat rate improvements in fossil-fired EGUs, shifts in dispatch to less carbon-intensive generation sources, and reductions in fossil-fuel fired generation from increased zero-carbon and low-carbon generation and increased demand-side efficiency—as reflected in building blocks 1 through 4—achieve a high degree of cost effective carbon emissions reductions. The emissions reductions we have achieved are significantly greater and more cost effective than could be achieved by heat rate improvements and redispatch alone. Consequently, the BSER should be composed of the entire system reflected in all four building blocks.

⁹⁸ 79 Fed. Reg. at 34878.

II.C. State Experience Confirms that this Overall Level of Implementation is Achievable

Our state experience also confirms that the overall, national level of reduction expected from EPA's proposed emission guideline is achievable, as many of our states have cost-effectively achieved even greater reductions on a shorter timeframe.

EPA projects that the proposed emission guideline will achieve a 22 percent reduction over a 19-year period (2012-2030).⁹⁹ As described above, many of our states have already achieved reductions of this magnitude in a shorter time frame. On average, our states have reduced carbon pollution from the power sector by 23 percent in the eight-year period between 2005 and 2012.¹⁰⁰ The nine states¹⁰¹ participating in the Regional Greenhouse Gas Initiative have together reduced carbon pollution in the region by over 40 percent from 2005 to 2012.¹⁰²

In short, the collective experience of our states demonstrates that the system identified by EPA is already being successfully implemented to achieve emission reductions of a similar magnitude, in a shorter timeframe, than the overall reductions proposed by EPA, and a number of are states have achieved significantly greater reductions.

II.D. Translating Rate-Based Goals to Mass-Based Emission Budgets

We strongly support EPA's proposal to allow states the option of complying with a mass-based emission budget equivalent to the rate-based state goal identified in the emission guideline. Mass-based approaches have many advantages, including harnessing the market's ability to find the most cost-effective reduction opportunities and ease of administration and compliance. Our group of states does not take a consensus position regarding the specific translation methodologies presented in the Technical Support Documents that accompany the proposed rule.¹⁰³

We note that a number of our states have programs that promote clean vehicles, and that will result in reductions of carbon pollution and other air pollutants. Most importantly, this includes the Zero Emission Vehicle (ZEV) regulations—which require that zero-emission vehicles constitute a percentage of vehicle sales—and a supporting

⁹⁹ Computed based on 2012 CO₂ emissions data for U.S. power sector and EPA RIA projections from all power sector sources under state scenario in 2030

¹⁰⁰ *Supra* note 45.

¹⁰¹ Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

¹⁰² RGGI, *supra* note 79, at 1.

¹⁰³ U.S. EPA, Technical Support Document: Projecting EGU CO₂ Emission Performance in State Plans, (June 2014), <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-projecting-egu-co2-emission-performance>; U.S. EPA, Technical Support Document: Translation of the State-Specific Rate-Based CO₂ Goals to Mass-Based Equivalents (Nov. 2014), <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-translation-state-specific-rate-based-co2>.

memorandum of understanding (MOU) that have been adopted by eight of our states.¹⁰⁴ The MOU establishes a collective target of placing 3.3 million zero emission vehicles on the road by 2025; the majority of the vehicles will be plug-in electric vehicles. Shifting to these electric vehicles from conventional petroleum-fueled vehicles will significantly reduce overall carbon pollution in our states, but it will also affect electricity demand. We urge EPA to work with the MOU states to identify a rigorous load-growth projection or methodology that takes into account any projected load changes from these regulatory ZEV programs for the purposes of translating from a rate-based state goal to a mass-based emission budget.¹⁰⁵

II.E. Support for Interim Targets and Compliance Flexibility

Our states generally support EPA's proposed two-part goal structure that requires states to meet a ten-year average interim goal 2020 to 2029 and a final goal in 2030 in their state plans.

Given that carbon dioxide remains in the atmosphere for a century or more, strong interim targets are important to the proposed rule's environmental protectiveness. As we noted earlier, our states are already experiencing the harms of climate change, and therefore cost-effective steps to reduce carbon pollution should be taken as soon as possible.

Interim targets are also important in that they enable timely, comprehensive planning to reduce a broad range of air pollutant emissions in an integrated and cost-effective way. The inclusion of interim targets beginning in 2020 combined with a ten-year averaging period provides states with both a clear signal of the significant CO₂ reductions required in the near term and the flexibility to meet those reductions while taking into account obligations to reduce other pollutants. This allows states to holistically address not only CO₂ emissions under the Clean Power Plan but also mercury and air toxics emissions under the Mercury and Air Toxics Standards, cross-border air pollution under the Cross-State Air Pollution Rule, ozone precursors contributing to nonattainment areas under the upcoming revision to the ambient air quality standard for ozone, and haze-creating pollutants under the Regional Haze Program. Comprehensive planning is more cost-effective, ensuring that investments made in pollution controls are not stranded if high-emitting power plants become less economical to run under the broader framework of clean air standards. Providing interim targets combined with a flexible 10-year averaging period leading to a final 2030 goal will provide states and power companies with the regulatory certainty to make these cost-effective investment decisions.

¹⁰⁴ State Zero-Emission Vehicle Programs Memorandum of Understanding (Oct. 24, 2013), http://www.arb.ca.gov/newsrel/2013/8s_zev_mou.pdf.

¹⁰⁵ This is not a recommendation that EPA should credit offsetting reductions in carbon pollution in the electricity sector.

We appreciate the flexibility that EPA has already provided in allowing the interim goal to be met through a ten-year rolling average during the period from 2020 to 2029. This is an effective way to allow states to develop their own “glide path” to meet the level of emission performance required by the final goal in 2030.

EPA recognizes in the Notice of Data Availability (NODA) that some stakeholders have indicated that the flexibility provided by the ten-year averaging period for interim goals is constrained by the stringency of some states’ interim goals. As noted above, we strongly support the inclusion of interim targets, but also encourage EPA to provide states additional flexibility for meeting these interim targets. For example, we encourage EPA to allow states to credit certain reductions achieved between the proposal of the rule and 2020; we also encourage EPA to allow states the option to begin the interim compliance period before 2020 and therefore have a longer averaging period. EPA took comment on both of these mechanisms in the proposal and the NODA. We strongly encourage EPA to allow states to set forth their own interim milestones and glide path while meeting the enforceable interim target (on a 10-year average, as proposed) and the 2030 emission target.

In the event that EPA chooses to provide states with greater interim flexibility in a way that reduces the emissions reductions that would have otherwise been achieved in the interim period, we encourage EPA to consider other changes identified in this letter that would reflect additional cost effective opportunities for reductions, including implementing a reasonable minimum floor for a shift to natural gas.

II.F. Considerations for Potential Changes to Building Blocks

Many of our individual states will submit separate comments that may include suggested refinements to the building block and goal computation calculations. In response to EPA’s requests for comment in its Notice of Data Availability, we provide the following input on selected potential changes to the building block methodology:

Building Block 2 – Minimum Level of Generation Shift to Natural Gas

In the NODA, EPA requests comment on whether building block 2 should include an assumption about a minimum level of generation shift from higher-emitting fossil steam generation to lower-emitting natural gas generation. This proposal reflects stakeholder comments that there is a significant opportunity to reduce emissions not only by shifting generation to existing NGCC units with additional capacity, but also by shifting generation to new NGCC units or by co-firing or repowering with natural gas at existing coal-fired EGUs. Under this proposal, all states would be assumed to have some potential for reducing emissions through a shift to natural gas generation under one of these pathways.

In our experience, there is significant opportunity to reduce emissions from affected sources by shifting to natural gas generation in all three ways. Our states have collectively achieved significant improvements in emission performance through

increases in utilization of existing NGCC units, as originally proposed in EPA's building block 2. In addition, however, our states have also experienced significant improvements in emission performance due to shifts in generation to *new* NGCC units as well as through co-firing or repowering with natural gas at existing coal-fired EGUs.

Incorporating into the BSER the potential to improve emission performance from all three of these methods of shifting to natural gas generation is in keeping with EPA's overall approach and would better reflect the actual system that our states have used to achieve emission reductions.

EPA's original proposal considered the potential to shift generation from coal-fired power plants to existing, underutilized NGCC plants. The proposal rightly recognized that due to the interconnected nature of the power grid and interoperability of different generation resources, reduced use of high carbon-intensity EGUs would result in increased utilization of other generation resources, such as efficient NGCC plants.

As demonstrated by our state experience, however, focusing only on shifts to existing NGCC units does not capture the other ways in which changes in the electricity sector are leading to emission reductions at existing fossil-fired EGUs.

A diverse array of coal plants across the country have been or are being converted to burn natural gas, reducing carbon pollution from these plants. Co-firing and converting to gas at coal boilers provides significant reductions not only in carbon pollution but also in harmful co-pollutants emitted by coal plants, and facilitates attainment of other clean air standards.¹⁰⁶

New natural gas plants are currently being constructed, and market trends indicate that more will be constructed in the future.¹⁰⁷ In many states, power companies have already identified their intent to replace generation from older, inefficient coal-fired EGUs with new, efficient NGCC units.

We therefore support EPA's proposal to establish a reasonable minimum value as a floor for the amount of generation shift to natural gas for purposes of building block 2, which could include re-dispatch to existing NGCC units, re-dispatch to new NGCC units, or co-firing with natural gas in existing coal-fired boilers. This methodology would better reflect the system that our states have already demonstrated has been effective at reducing CO₂ emissions from affected sources.

Building Block 2 – Phase-In

EPA requests comment in the NODA on the potential for gradually phasing in building

¹⁰⁶ Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014).

¹⁰⁷ U.S. Energy Information Administration, Annual Energy Outlook (2014).

block 2 to address concerns about interim goal stringency. This group does not take a position on whether EPA should phase in building block 2, and our states may have different positions on this issue. However, if EPA does choose to develop a phase-in schedule for building block 2, we encourage the Agency to base any rate of transition from existing coal to existing underutilized NGCC capacity on technical considerations relevant to such a transition. We recommend that EPA carefully consider historic changes in the relative utilization of coal and NGCC plants in response to price considerations, as well as natural gas supply capacity, as an important source of information about the potential for and pace of shifts in utilization between coal- and gas-fired power plants.

III. State Plan Issues

III.A. Support for EPA's Flexible Approach to State Compliance

Our states generally support EPA's proposed approach to state compliance, which allows states to use and build upon existing programs and successes, employ the most cost-effective strategies available under either rate-based or mass-based compliance frameworks, adapt approaches to their unique situations, and consider multi-state strategies.

Below, we offer support for specific elements of EPA's proposal, as well as suggestions for refinements that could help ease state implementation of the rule. In particular, we support EPA's efforts to address the enforceability of measures included in state plans; as EPA continues to hone available compliance methods, we urge the Agency to offer states strategies that appropriately balance accountability for significant emissions reductions with the ability to innovate to secure these reductions.

We support EPA's effort to allow states to extend the deadline to submit plans, but also ensure that they make progress toward a complete plan. Additionally, our states appreciate EPA's efforts to provide the flexibility to build upon our existing, proven state programs for compliance. Finally, we are pleased that EPA recognizes the importance of evaluation, measurement, and verification (EM&V) for renewable energy and energy efficiency, and we provide input on EPA's proposal to develop EM&V methodology guidance based on our states' extensive experience operating these programs and accounting for their electricity savings and emissions reductions.

III.B. Portfolio Approach, Enforceability, and Corrective Measures

We appreciate the flexible approach taken by EPA with regard to state compliance options. As many of our states noted in a December 2013 letter, it is important for states with established and proven clean energy and efficiency programs to be able to build on those programs for compliance. The enforceability mechanisms that EPA requires in state plans should support these existing programs, as well as new programs

in other states, by minimizing program changes required purely to conform with federal requirements, while still providing enough additional program review and accounting to ensure that required reductions are achieved.

To that end, we provide the following recommendations related to enforceability and state plan development:

Diversity in Emission Allowance Programs: Tradable allowance systems incorporating covered EGUs are likely among the most efficient ways of ensuring enforceability, and are a favored state design option under the general Section 111(d) regulations.¹⁰⁸ However, existing and future allowance program designs will vary, and the final rule should accommodate this diversity. For example, while the RGGI program covers only EGUs, the California carbon market includes other sectors. As regional carbon markets expand over time and EPA fulfills its obligations to regulate carbon pollution from other industries, both sectoral and economy-wide allowance programs may be used. EPA should recognize either sort of allowance program as sufficient for compliance with the rule, provided that an appropriate demonstration is made that the program (combined, if necessary, with other measures) will ensure that covered emissions from regulated sources will conform to federal requirements.

State Flexibility to Adjust Program Details: Likewise, EPA should consider which specific elements of state-based allowance systems must be made federally enforceable, and which may remain as state-enforceable infrastructure for these programs. Provided that states implementing these programs rigorously demonstrate to EPA that their systems will achieve required reductions, EPA should ensure that these states retain flexibility to adjust program details and amend market regulations as appropriate. For example, EPA might consider whether key program components—such as the total allowances in the system and the requirement that sources hold allowances to cover their emissions—should be federally approvable, while implementation details remain state law matters.

Support for Portfolio and State Commitment Approaches: We support allowing states the option to use a “portfolio” approach to design programs that place some but not all compliance obligations on affected EGUs, as long as state plans ensure that the emissions of the covered sources decline on the required glide path. We also urge EPA to allow states the option of employing a “state commitment” version of this portfolio approach, as long as a source-level, federally enforceable backstop is required.¹⁰⁹

¹⁰⁸ 40 C.F.R. § 60.24(b)(1) (“Emission standards shall either be based on an allowance system or prescribe allowable rates of emissions except when it is clearly impracticable.”).

¹⁰⁹ In response to EPA’s requests for comment on the portfolio approach proposed and option for “state commitment approach.” 79 Fed. Reg. at 34901-02.

Under the portfolio approach as proposed, states could designate different “affected entities” that would be responsible for complying with portions of state plans. It is important that EPA afford states considerable discretion as to which entities would be included in such an approach and how accountability would be structured. Section 111(d) gives states broad flexibility to achieve the required emissions reductions. States, subject to EPA approval, may determine how those reductions are most effectively implemented, including direct emissions reductions from covered EGUs and complementary state energy planning actions that reduce demand on affected EGUs; however, many of the underlying regulatory details of these state actions may not need to be federally enforceable, depending on the overall design of a given state plan.

Instead, it would be appropriate under some circumstances for EPA to accept an “enforceable commitment from the state itself to implement state-enforceable measures” which will achieve a portion of the required emissions reductions, at least in the first instance. Under this “state commitment” approach, variations of which have already been used in the Section 110 context, state energy program measures, for instance, would not be directly federally enforceable (and so not subject to federal and citizen enforcement under the Clean Air Act), but the commitment to achieve the reductions that they support *would* be enforceable against the state planning entity. The result is to curtail emissions from affected EGUs consistent with system-level reductions, while maintaining state control over the regulatory details of the state energy planning measures that support those reductions. Furthermore, under this approach, the states themselves would determine the appropriate role of different state agencies in implementing and overseeing such programs.

In order to guarantee the reductions the final rule will require, state planners would need to support these commitments with clear initial demonstrations that the required reductions will be achieved, regular reporting during the compliance period, and clear contingency and federally enforceable backstop measures if the expected reductions are not achieved. In particular, we strongly recommend that EPA require that state plans using a state commitment approach include a backstop that automatically places a federally enforceable limit on covered EGUs, to secure any reductions that state plan commitments do not deliver. The state would choose the mechanism for the federally enforceable limit; for instance, the backstop could take the form of a mass-based allowance system or a rate-based averaging system.

For example, a state choosing to pursue a state commitment approach would develop a plan that includes a limit on affected EGUs that itself is not sufficient to achieve the state’s overall emission performance requirement. In the plan, the state would also commit to implementing other measures, such as renewable energy and energy efficiency programs, to make up the difference; that commitment by the state would be federally enforceable against the state itself, although the underlying programs would not be federally enforceable. A well-designed plan would include clear and rigorously

defined interim contingencies that would be automatically triggered if the state commitments do not deliver the expected reductions in emissions. Interim contingencies could include expansions of state program commitments, such as committing more of the underlying resource savings from an existing energy efficiency resource standard, or scaling up the state programs themselves if all underlying resources have been committed.

In addition, the state plan should be required to include as a final backstop a federally enforceable limitation on affected EGUs sufficient to guarantee that the state goal will be met should the initial state commitment measures and any interim contingencies fail to achieve the required level of emission reduction. This backstop would be triggered automatically at a specific milestone—for example, after a state’s emissions from affected EGUs significantly exceed its projected emission performance glide path for more than one year even after any interim contingency measures have been put into effect. The federally enforceable backstop could be implemented as either a rate-based or mass-based limitation on EGUs sufficient to secure any reductions that state plan commitments do not deliver.¹¹⁰ For example, the backstop could be implemented as an allowance trading system under a mass-based approach. Alternatively, the state could choose a backstop to be implemented as a federally enforceable rate-based averaging mechanism that includes adjustments or credits based on energy efficiency or renewable energy so long as the state plan includes a rigorous methodology for crediting real and meaningful reductions.

An appropriately designed commitment system in the Section 111 context would create incentives for state planners and covered entities to work together to secure reductions from the electric system as a whole. EPA Regional Administrators, evaluating state plans pursuant to the final rule and the general Section 111(d) regulations, should only approve plans that create these incentives and maintain appropriate rigor.

Enforceability of Complementary and Baseline Measures: Finally, we approve of EPA’s recognition that some complementary emission reduction measures may not need to be federally enforceable because other measures capture their effects (such as, for example, a cap-and-trade system that is supported by a separate renewable portfolio standard). States and EPA regional offices should decide together which particular measures must be reflected in enforceable plans, and which may not.

Similarly, consistent with EPA’s earlier “Roadmap” for including certain energy policies in Section 110 plans, EPA should recognize that some measures now in force likely represent baseline measures that need not themselves be federally enforceable

¹¹⁰ Although the enforceable obligation would be on EGUs, this does not mean that the EGUs would be required to achieve reductions through on-site interventions only, as described below.

because they have already been incorporated into state policy. Of course, plan revisions may be warranted if states do not continue implementing these measures.

In sum, we believe that EPA and the states can develop enforceable state plans that will maintain state progress toward federal goals, while preserving significant flexibility for states to continue developing and improving reduction approaches. This flexibility, which is appropriate and necessary given Section 111(d)'s system-level mandate, can best be provided by balancing support for state policy development with rigorous reporting, analysis, and enforcement. We encourage EPA to finalize a rigorous state commitment-based approach as an option for state planning, which will enhance states' ability to deliver the reductions required.

III.C. Plan Development Timeline and Process

We applaud EPA's effort to structure the state plan submittal timeline to allow states additional time if needed to develop state plans, while still ensuring progress toward a complete plan. Specifically, we support EPA's proposal to provide a one-year extension to June 30, 2017, for states to submit a complete individual state plan if the state documents the need for additional time, and a two-year extension to June 30, 2018, if the state plan includes a multi-state approach.

We also support EPA's proposal of an initial plan due by all states on June 30, 2016, to meet the timeline established in President Obama's June 2013 Presidential Memorandum on Power Sector Carbon Pollution Standards. These initial plans appropriately require states to demonstrate commitment to creating an individual state program or participation in a multi-state planning process, as well as progress toward the development of a complete state plan or multi-state plan.¹¹¹ Initial plans also appropriately require initial quantification of the level of emission performance that will be achieved in the plan; our states support this requirement but note that this quantification ought not require complex methodology or modeling.

We note that some states may need more time beyond the provided extensions to develop state plans, due to time-intensive stakeholder processes, regulatory requirements, and the need in many states for legislative approval or other action. We suggest that EPA consider allowing states an additional one-year extension for the final plan under certain circumstances. Such a request should be granted only upon a showing of good cause—for example, where a state plan requires legislative approval and a state legislature meets only every other year.¹¹²

¹¹¹ In response to EPA's request for comment on initial plan elements and whether the guidelines should require a state to have taken significant, concrete steps toward adopting a complete plan for the initial plan to be approvable. 79 Fed. Reg. at 34916.

¹¹² In response to EPA's request for comment on the approach for extensions. 79 Fed. Reg. at 34915.

We also note that development of state plans will require significant staffing and resources, and we urge the federal government to provide additional funds to support state plan development.

In addition, we note that our states have extensive experience developing state and regional clean energy and carbon emission reduction programs. We are willing to work with other states to share information, analysis, and lessons learned from our programs as all states begin to consider compliance options and develop state plans.

III.D. Clarity on Recognition of State Programs for Compliance

Our states appreciate EPA's efforts to provide the flexibility to build upon existing programs for compliance. As stated previously, states that already operate successful clean energy, efficiency, and other climate programs should be able to use those programs to comply with EPA's final rule. To clarify precisely how emissions reductions from state programs will be credited, we request that EPA provide more detailed guidance on the recognition and crediting of state programs toward compliance.

In particular, clarity is needed regarding the mechanisms that would be used to recognize emissions reductions achieved by existing state programs in the time between the proposal of the rule and the beginning of the interim compliance period.¹¹³ Greater clarity is also needed regarding the way in which renewable energy generation and avoided generation from energy efficiency are credited toward meeting a rate-based state goal.

III.E. Measuring and Verifying Energy Efficiency and Renewable Energy

Our states appreciate that EPA recognizes the importance of quantifying, monitoring, and verifying the electricity generation or electricity savings effects of renewable energy and demand-side energy efficiency measures. We have extensive experience operating energy efficiency and renewable energy programs and measuring the electricity savings and emissions reductions they achieve.

We support EPA's proposal to require state plans that include enforceable renewable and efficiency measures to include an EM&V plan, as well as EPA's proposal to develop guidance on acceptable EM&V methods to be incorporated into such a plan. We encourage EPA to provide draft EM&V methodology guidance before the final rule is issued, and to work with states, DOE, and other stakeholders to develop the guidance; in particular, EPA should solicit EM&V methodology input from states with well-established programs.¹¹⁴ The development and use of consistent and robust EM&V methodologies for well-established and emerging energy efficiency programs will help

¹¹³ In response to EPA's request for comment on approaches for recognizing existing programs. 79 Fed. Reg. at 34918.

¹¹⁴ In response to EPA's request for comment on approaches for EM&V. 79 Fed. Reg. at 34921.

to establish equivalence across the country. As EPA moves forward with creating its final rule, it should endeavor to provide consistency in state target setting and compliance, while allowing for traditional resource acquisition programs and innovative market development and financing programs in a manner that recognizes the contribution of state efforts.

We also urge EPA to continue communicating and coordinating with Public Utility Commissions and other entities charged with oversight of demand reduction programs, and encourage additional cooperation between EPA and DOE.

Energy Efficiency Measures

Our states support a “middle ground” approach to establishing standards for EM&V protocols to measure savings from energy efficiency measures in state plans, to allow for flexibility while supporting consistent verification of energy savings across all states. As presented by EPA,¹¹⁵ this approach balances certainty and flexibility by providing specific EM&V criteria for the most common and high-achieving energy efficiency strategies, while providing generalized guidance for new or emerging approaches. We also suggest that EPA include a state certification option for energy efficiency programs or measures, under which the state may propose a methodology for EPA, with involvement from DOE, to approve.

We agree with EPA that there is a range of established EM&V procedures and protocols across energy efficiency measures, and we recognize that flexibility in crediting these measures will support new innovative approaches. EPA should credit well-established standardized programs with uniform, accessible, and transparent methodologies. In developing EM&V guidance for the well-established energy efficiency approaches, we suggest EPA consider the approaches developed by the DOE Uniform Methods Project, Pacific Northwest Regional Technical Forum (RTF), Northeast Energy Efficiency Partnerships (NEEP) EM&V Forum, and ISO-NE, among others. We encourage EPA to clarify what the Agency considers “adequate documentation” for innovative energy efficiency measures, given the wide range of practices across public utility commissions (PUCs). For example, approaches to evaluate measure life and persistence of energy savings vary among PUCs, as noted by EPA.¹¹⁶

Renewable Energy Measures

Our states agree with EPA that many existing state and utility requirements for quantification, monitoring, and verification of renewable energy programs provide a

¹¹⁵ U.S. EPA, Technical Support Document: State Plan Considerations 56 (June 2014), <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-state-plan-considerations>.

¹¹⁶ *Id.* at 50.

good basis for EPA to establish EM&V guidance for renewable energy measures included in state plans. We support EPA's development of guidance on acceptable EM&V methods and encourage EPA to work with DOE, states and stakeholders in developing that guidance, as discussed above.

III.F. Consistency and Rigor in Plan Evaluation and Approval

Just as consistency and rigor are key criteria for EM&V methodology, consistent evaluation and approval of individual state plans will help ensure a well-functioning national program and equitable treatment among states. This consistency will be especially important given the flexibility provided to states to develop unique state plans to suit individual state situations. Our states generally support the required plan components and evaluation criteria as proposed;¹¹⁷ however, we request that EPA provide sufficient guidance to Regional Administrators to ensure that all state plans are evaluated and approved consistently across different regions.

In response to EPA's request for comment on the option of partial or conditional approval,¹¹⁸ our states encourage EPA to finalize a rule that allows for partial or conditional approval of state plans, provided EPA develops a specified procedure for the state to cure the deficiencies identified in a partially or conditionally approved plan before EPA imposes a federal plan.

Additionally, we support EPA's proposal to allow states to modify approved state plans so long as the state demonstrates that the revision will not reduce the plan's emission performance.¹¹⁹

IV. Interstate Compliance, Accounting, and Effects

Our states applaud EPA's provision of flexibility to states to work together for compliance. Multi-state coordination provides substantial benefits, and can also resolve accounting issues and unwanted interstate effects that may arise between adjacent state programs of varying designs, as many of our states noted in a previous submission to EPA. As EPA recognizes in its proposal, the electricity grid is a complex interstate system, and coordination of state planning can help ensure a well-functioning national system. Multi-state planning processes and dialogues allow states to share information and analyses as they consider compliance options, and increase understanding of the ways state programs may interact. Coordination of compliance approaches will encourage more

¹¹⁷ In response to EPA's request for comment on all aspects of general approvability criteria and the twelve specific plan components. 79 Fed. Reg. at 34909.

¹¹⁸ 79 Fed. Reg. at 34916.

¹¹⁹ 79 Fed. Reg. at 34917.

efficient outcomes that are more closely aligned with the current electricity system, and provide more cost-effective compliance options and reduce administrative costs.

Multi-state approaches to reducing pollution have proven successful in many contexts, such as regional haze regulations and several iterations of programs to reduce transport of ozone and particulate matter. In the greenhouse gas emissions context, RGGI provides an example of a highly successful regional budget trading program that has achieved substantial reductions cost-effectively. We commend EPA for recognizing these benefits and allowing states the flexibility to design programs that allow for multi-state collaboration, and support EPA's proposed extended timeline for multi-state engagement and the requirement of a rigorous but attainable demonstration of progress toward a potential multi-state approach.

Below, we provide suggestions for refinements to the proposal that could help make it easier for states to pursue a range of collaboration options. For example, this range could include standardized mechanisms to trade renewable and energy efficiency credits, or agreements on how to allocate avoided emissions from renewable energy and energy efficiency. Clarification of the variety of collaborative options available to states may encourage participation in the regional coordination and planning processes that are beginning to take place around the country.

We also urge EPA to provide effective guidance to ensure harmonious interaction among state plans, including prohibiting double counting but also promoting full use of energy efficiency and renewable energy.

IV.A. Clarifying EPA's Support for Multi-State Collaboration and Coordination

Encouraging "No Regrets" Participation in Regional Processes

In addition to the potential benefits of multi-state approaches to compliance, as discussed above, there are also substantial benefits to "no regrets" participation in multi-state coordination and planning processes. Such regional processes are taking place around the country, allowing participating states to share information and analysis while considering their compliance options. We urge EPA to recognize the importance of these multi-state dialogues, and provide states flexibility to participate in these multi-state processes while considering their individual compliance options.

In response to EPA's request for comment on the required elements of an initial plan,¹²⁰ we suggest a clarification to the proposed element requiring a Memorandum of Understanding or similar agreement with other states if a multi-state approach is being pursued, in order to encourage states to participate in multi-state dialogues. We suggest

¹²⁰ 79 Fed. Reg. at 34916.

that such an agreement should demonstrate meaningful commitment to a multi-state planning process and a timeline for concluding the process, but should not be a burdensome requirement that necessitates legislation.

Allowing Additional Time to Design Multi-State Approaches

Our states applaud EPA's effort to allow more time for multi-state engagement by giving states pursuing multi-state approaches an additional year to submit their plans, while also ensuring progress toward development of a multi-state program through the initial plan requirements.¹²¹

Providing Flexibility to Join or Leave Multi-State Programs

Multi-state approaches will need a process to address a state joining or leaving a collaborative process or arrangement. We request that EPA work with states to identify approvable "on-ramps" and "off-ramps" in state plans with collaborative efforts. We also ask that EPA provide guidance on how states could use a plan revision or other mechanisms to join or form a multi-state collaboration in the future.

Additionally, we suggest that for this purpose, calculating a multi-state, mass-based goal by aggregating individual state mass-based goals would be simpler than requiring a methodology that includes modeling projected emissions from the entire region. This would allow the multi-state goal to be adjusted more easily if a state joins or leaves the program. EPA proposes that a multi-state mass-based goal be based on translation of an aggregation of the state-specific rate-based CO₂ emission performance goals, and seeks comment on options for calculating a weighted average rate-based emission performance goal for multiple states.¹²² We encourage EPA to provide states the additional option to calculate a multi-state mass-based goal by aggregating individual mass-based state goals.

Clarifying Potential Collaboration Options

We believe states should have maximum flexibility to determine what kinds of collaborations might work for them. These could include submission of joint plans, standardized approaches to trading renewable or energy efficiency credits, or negotiated agreements on how to allocate avoided emissions or generation from renewable energy and energy efficiency among states.

In response to EPA's request for comment, we request that EPA provide states the broadest number of options for how to incorporate such collaborations into state plans.

¹²¹ In response to EPA's request for comment on potential mechanisms for fostering multi-state collaboration. 79 Fed. Reg. at 34921.

¹²² 79 Fed. Reg. at 34911.

Specifically, we request that in addition to allowing states to submit a single multi-state plan, EPA also allow states the options of: 1) submitting individual plans for state-specific elements and including a common submittal that addresses common plan elements, and 2) separate individual submittals that are materially consistent for all common plan elements that apply to all participating states.¹²³ These two options would provide the necessary flexibility for states to develop interstate agreements while keeping autonomy over state-specific plan elements, and may encourage more states to participate in multi-state collaborations. We therefore urge EPA to finalize both additional multi-state plan submittal options on which the Agency takes comment.

We also encourage EPA to help facilitate such interstate agreements or multi-state collaborations by working with states to either identify or provide a platform or framework that states may elect to use for the tracking and trading of avoided generation or emissions credits due to interstate efficiency or renewable energy. EPA has previously administered emissions trading programs under the Clean Air Act, such as the Acid Rain Program and the NO_x Budget Program. EPA could provide such a platform, support a third party to provide such a platform, or work with states to build on existing platforms; such options would alleviate the potential administrative burden of developing a trading program and allow states to pursue the option of interstate trading agreements at less cost.

IV.B. Accounting for Interstate or Interregional Effects of Plan Measures

We appreciate that EPA's proposal recognizes the complexity of accounting for interstate effects of state plan measures, and makes efforts to take into account the emissions reductions resulting from renewable and efficiency measures while also minimizing double counting.

Our states recommend that EPA address accounting for interstate renewable energy and energy efficiency by explicitly prohibiting double counting but also promoting full use of the emission reductions that occur as a result of energy efficiency and renewable energy. Specifically, in response to EPA's request for comment on interstate effects,¹²⁴ a state should be able to take credit for emission reductions achieved out of state due to in-state energy efficiency or renewable measures as long as the reductions will not be double-counted.¹²⁵

¹²³ *Id.*

¹²⁴ 79 Fed. Reg. at 34922.

¹²⁵ These comments do not take a position on which state should bear the burden of demonstrating that reductions achieved through renewable energy or energy efficiency are not double-counted, as there was no consensus on this issue. For this reason, it should not be inferred that these comments suggest either that a state making investments in or implementing policies that result in renewable energy or energy efficiency should bear the burden of proving there is no double counting of reductions resulting from those policies or investments, or

EPA requests comment on what a demonstration that interstate accounting for renewable energy or energy efficiency will not result in double counting would entail. We recommend that EPA provide guidance on EM&V methodologies that would be acceptable for states to demonstrate and take credit for emissions reductions achieved by their renewables and efficiency programs. We provide more detailed suggestions for EM&V methodology in Section III.

Accounting of the emissions reductions achieved through interstate renewable energy and energy efficiency without double-counting could be accomplished, for example, through standardized credit trading or an agreement to distribute avoided emissions from renewable energy and energy efficiency, as discussed above. Likewise, as we suggest above, a consistent trading platform could streamline this accounting and ensure that interstate renewable energy and efficiency are fully accounted for using standardized currency while alleviating the administrative burden on states. Finally, we urge EPA to minimize potentially harmful interstate effects, by working to minimize the perverse market incentives or disincentives that could result from a patchwork of state programs with different compliance frameworks.

V. Conclusion

In conclusion, we appreciate EPA's unprecedented outreach before the rule issuance, and for developing a proposal that incorporated and addressed many of the comments raised by our states and other states and stakeholders. We support EPA's framework for the proposed rule, especially the approach to the best system of emission reduction and the flexibilities provided to states. In response to EPA's requests for comment, we have offered suggestions on how to clarify and refine the rule.

We commend EPA on taking this crucial first step in what must be an incremental, long-term plan to reduce emissions from all sectors in all states. This proposed rule represents the most significant component of our national effort to reduce carbon emissions throughout our economy. We look forward to continuing to work with EPA to finalize this rule, inform associated guidance, and work towards successful implementation.

that a state achieving reductions under a mass-based system should bear the burden of proving that there is no double counting because of the effects of out-of-state renewable energy or energy efficiency policies on in-state generation. Individual states may take positions on these issues in their own comments.

Attachment:

**States' Roadmap on Reducing Carbon Pollution
Submitted to U.S. EPA December 16, 2013**

December 16, 2013

Gina McCarthy
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Administrator McCarthy,

We are a group of state environmental agency leaders, energy agency leaders, and public utility commissioners from 15 states that have taken action to promote clean energy and address climate change. Please accept our enclosed joint comments on forthcoming carbon pollution standards for existing power plants. The development of these comments was facilitated by the Georgetown Climate Center.

At the outset, we applaud the commitment by President Barack Obama and the United States Environmental Protection Agency (EPA) to tackle head-on the challenge of climate change, and to focus in part upon reducing carbon emissions from existing power plants, which account for 33 percent of total greenhouse gas emissions nationwide.¹

The President, in his June 2013 Presidential Memorandum, called on EPA to build on the leadership that many states, cities, and companies have already shown in reducing carbon pollution from the power sector as it develops its own standards under section 111(d) of the Clean Air Act.² EPA subsequently asked for states to provide feedback on specific issues, including state experiences with carbon pollution reduction programs.³

We are happy to share our experiences with you. Our states are already achieving significant carbon pollution reductions from the power sector, and are demonstrating a variety of ways in which such reductions can be achieved. Through market-based programs, renewable portfolio standards, energy efficiency resource standards and funding commitments, utility planning, and other efforts, our states have reduced carbon pollution from the electricity sector by 20 percent from 2005 to 2011, and similarly improved our net carbon emission rate 19 percent over the same time period. Many individual states have achieved even greater reductions in carbon pollution—in the range of 30 to 46 percent—in that time period. Our state programs are

¹ U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011 (2013), <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>.

² Presidential Memorandum from Barack Obama to the EPA, June 25, 2013, <http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards>.

³ U.S. EPA, Considerations in the Design of a Program to Reduce Carbon Pollution from Existing Power Plants (2013), <http://www2.epa.gov/sites/production/files/2013-09/documents/20130923statequestions.pdf>.

delivering major economic and health benefits by reducing carbon pollution and traditional pollutants while driving investments in energy efficiency and renewable energy.

We encourage EPA to develop a stringent but flexible framework that equitably achieves meaningful reductions in carbon pollution from the electricity sector while recognizing that states may employ a variety of strategies, including successful state programs already in force, to achieve these goals.

As we detail in our enclosed comments, we urge EPA to:

- Establish the performance level of the standard based on a “best system of emission reduction” that reflects the full range of approaches that states have successfully demonstrated can cost-effectively reduce carbon pollution from the electricity system as a whole;
- Establish the form of the emission guideline in a way that equitably recognizes the different starting points and circumstances of different states, including the pollution reductions achieved by states through climate and clean energy programs; and
- Allow for a variety of rigorous state compliance options, including options for compliance through participation in regional emission budget trading programs and state portfolio programs.

We are grateful to EPA for considering these comments. We are confident that by drawing on the lessons of state experience, EPA can develop emission guidelines that secure the benefits that our states have experienced from carbon pollution reduction for the nation as a whole.

Sincerely,



Mary D. Nichols
Chair
California Air Resources Board



Robert B. Weisenmiller
Chair
California Energy Commission



Michael R. Peevey
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California Public Utilities Commission



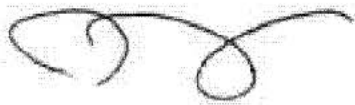
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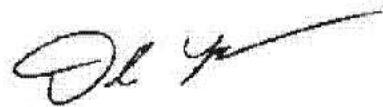
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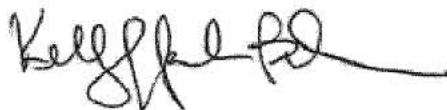
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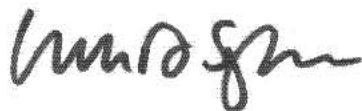
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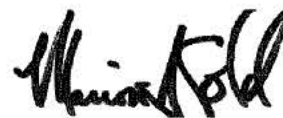
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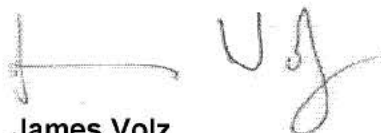
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Maia Bellon
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**States' §111(d) Implementation Group Input to EPA
on Carbon Pollution Standards for Existing Power Plants**

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I. Overarching Principles

Our states support EPA in developing a program that:

- **Achieves significant emission reductions from the power sector in line with the reductions needed to protect public health and welfare.** State greenhouse gas emission reduction goals and the President's commitment to achieve economy-wide carbon pollution reductions of 17 percent below 2005 levels by 2020 reflect the national consensus that these pollution reductions are essential. The electricity sector provides some of the most substantial cost-effective opportunities for reductions relative to other sectors, as evidenced by the reductions in excess of 17 percent already being achieved by state programs, changes in energy markets, and advances in clean energy technologies. As several states have recognized in their plans to achieve economy-wide greenhouse gas reduction goals, the power sector will have to reduce its emissions more than the overall 17 percent goal because reductions from other sectors (e.g., transportation) will be more difficult to achieve.
- **Allows for a variety of flexible compliance options for states by setting rigorous targets while giving states the authority to innovate to reach them.** This approach recognizes that different pathways may be appropriate for different states, that flexibility allows states to cost-effectively achieve reductions by identifying opportunities created by the complex and interconnected nature of the electricity system, and that flexibility also facilitates efficient integration with other environmental obligations and reliability needs.
- **Encourages states that have current effective carbon pollution reduction and clean energy programs to use those programs as compliance mechanisms to meet federal targets.** These include California's AB 32 and related programs, the Regional Greenhouse Gas Initiative's (RGGI) state programs, and other programs such as renewable energy standards and energy efficiency resource standards.
- **Recognizes the carbon pollution reductions already achieved by such state programs, while still achieving significant additional national carbon pollution reductions and creating an equitable national system.**
- **Recognizes the various states' different starting points, but places all states on a trajectory to achieve final targets of comparable rigor.**
- **Minimizes compliance costs and burdens, maintains electricity reliability, and maximizes economic and environmental benefits.**

II. States have Demonstrated Various Programs that are Achieving Meaningful CO₂ Emission Reductions in the Power Sector along with Other Significant Benefits

Our states—along with others—have developed a variety of state programs that achieve substantial, cost-effective carbon emission reductions and improvements in net carbon emission rates. Through market-based programs, renewable portfolio standards, energy efficiency resource standards and funding commitments, utility planning, and other efforts, our states have reduced carbon pollution from the electricity sector by 20 percent from 2005 to 2011, and similarly improved our net carbon emission rate 19 percent over the same time period, from 941 to 759 pounds CO₂ per megawatt hour of electricity produced (lbs CO₂/MWh).⁴ These programs are also delivering numerous additional benefits, including reductions of conventional pollutants and the significant public health benefits that accompany those reductions.

Our state programs have been developed through substantial democratic processes, and reflect the different on-the-ground experience of our states, including differences in the structure of energy markets and market participants.

Taken together, these approaches are driving improvements and innovation throughout the electricity system, leading to a cleaner and more efficient system overall.

⁴ Calculated from U.S. Energy Information Administration data. CO₂ emissions based on Total Electric Power Industry category, U.S. Energy Information Administration, U.S. Electric Power Industry Estimated Emissions by State, http://www.eia.gov/electricity/data/state/emission_annual.xls [hereinafter EIA State Electric Power Emissions]. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources. U.S. Energy Information Administration, U.S. Energy Information Administration, 1990-2012 Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923), http://www.eia.gov/electricity/data/state/annual_generation_state.xls [hereinafter EIA State Generation]. Generation includes generation from sources that do not emit carbon pollution, including renewable and nuclear sources.

Percent Change in Electricity Sector Carbon Dioxide Emissions, from a 2000 Baseline

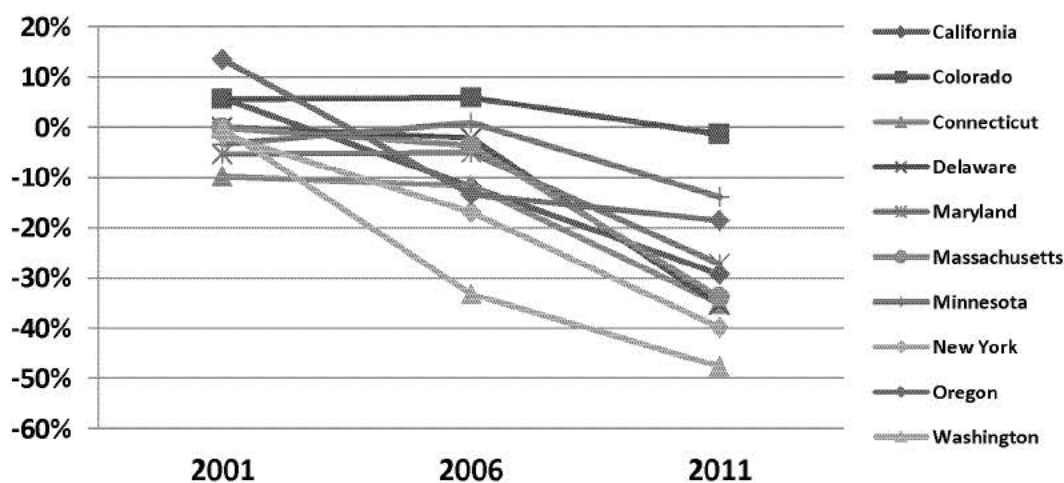


Figure 1: Many of our states have experienced very significant reductions in CO₂ emissions in the electricity sector over the past decade, demonstrating the levels of emission reductions that are achievable. Source: EIA, Total Electric Power Industry CO₂ Emissions.

Percent Change in the Carbon Dioxide Emissions Rate (lbs CO₂ / MWh), from a 2000 Baseline, Including All Electricity Resources

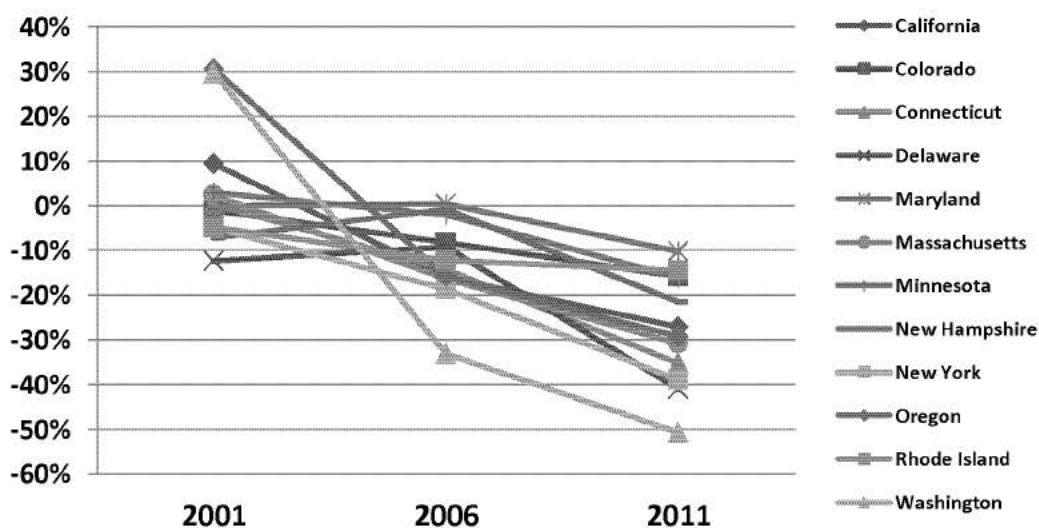


Figure 2: Similarly, many of our states have achieved very significant improvements in net carbon pollution emission rates (comparing total carbon pollution from the electricity sector to total electricity generation, i.e., lbs CO₂ / MWh). Source: EIA, Total Electric Power Industry CO₂ Emissions and Power Generation by State.

Approaches used by our states include the following:

Market-based programs: States that have market-based emission trading programs have demonstrated that these programs are an efficient, cost-effective way to achieve emission reductions and efficiently move the electric grid toward a cleaner system. These programs can operate as stand-alone programs or as “umbrella” policies that accumulate and account for emission reductions from complementary programs, such as renewable portfolio standards, energy efficiency programs, and emission reduction programs directed at other pollutants, as well as fuel switching and energy efficiency at power plants. Market-based programs can take different forms while yielding similar benefits.

For example, the nine states⁵ participating in the Regional Greenhouse Gas Initiative have together reduced carbon pollution in the region by over 40 percent from 2005 to 2012.⁶ The new RGGI cap⁷ of approximately 78 million tons in 2020 is more than 50 percent below 2005 levels. Participating states are investing revenue from allowance auctions into energy efficiency and clean energy programs that benefit consumers and contribute to carbon pollution reductions.⁸ These investments in energy efficiency have helped six of the nine RGGI states rank in the top ten most energy efficient states, according to the American Council for an Energy Efficient Economy. Massachusetts, which invests approximately 90 percent of its RGGI proceeds in energy efficiency, has been ranked the number one energy-efficient state for the last three years.⁹ An independent study found that the RGGI states have realized a \$1.6 billion net benefit from the first three years of the program’s operation, in large part due to the energy efficiency investments that have reduced consumer electricity spending and increased economic activity.¹⁰ The same study also found that the region would see a net increase of 16,000 jobs due to these energy efficiency investments and other auction revenue spending from the first three years of the program.¹¹

Participating states have found that RGGI captures the benefits of complementary state policies and has resulted in significant changes across the electricity system to reduce emissions. These

⁵ Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

⁶ Regional Greenhouse Gas Initiative, Report on Emission Reduction Efforts of the States Participating in the Regional Greenhouse Gas Initiative and Recommendations for Guidelines under Section 111(d) of the Clean Air Act 1 (2013).

⁷ RGGI establishes an overall emissions cap on the power sector. In 2013, the participating RGGI states agreed to reduce the emissions cap by 45 percent in 2014. Program Review, Regional Greenhouse Gas Initiative website, http://www.rggi.org/design/program_review.

⁸ RGGI Benefits, <http://www.rggi.org/market/CO2-auctions/results>; RGGI, Regional Investment of RGGI CO₂ Allowance Proceeds (2012), <http://www.rggi.org/docs/Documents/2011-Investment-Report.pdf>.

⁹ ACEEE, State Energy Efficiency Scorecard, <http://aceee.org/state-policy/scorecard>.

¹⁰ The Analysis Group, The Economic Impacts of the Regional Greenhouse Gas Initiative 33 (2011), http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf. The study looked at years 2009-2011.

¹¹ Jobs are “job years”, or one job sustained for one year. *Id.*

include investments by power companies to make existing units more efficient, shifts across the electricity system to greater use of cleaner fossil-fuel generation sources, reduction of electricity load growth through demand-side energy efficiency strategies, and replacement of fossil-fuel generation with increased renewable energy.

Similarly, the state of California has mounted a comprehensive effort to reduce greenhouse gas emissions, reflecting its commitments to cut carbon pollution to 1990 levels by 2020,¹² and by 80 percent below those levels by 2050, while setting ambitious mid-term targets to keep emissions trending downwards.¹³ In order to achieve these goals, California has implemented a comprehensive portfolio of policies, many under the authority of AB 32, California's Global Warming Solutions Act. This includes setting an economy-wide greenhouse gas (GHG) emissions cap that declines to 2020 along with a trading mechanism.¹⁴ Four successful allowance auctions have been held, and the cap is projected to reduce emissions by 25 percent from 2006 to 2020.¹⁵

As a result of these many efforts, California's utility sector greenhouse gas emissions have continued to decline. Based on initial estimates from the California Air Resources Board, emissions from in-state and imported power fell by 16 million metric tons, or 16 percent, from 2005 to the 2010-12 averaging period (from 108 million metric tons CO₂e to 91 million tons CO₂e).¹⁶ By 2025, California expects to cut utility sector emissions to below 80 million metric tons CO₂e, a roughly 25 percent reduction from 2005 levels in that sector, with already low emissions compared to other states.¹⁷

Renewable Portfolio Standards: At least 30 states have renewable portfolio standards (RPS) or alternative energy portfolio standards, which can increase renewable generation and displace carbon-intensive fossil fuel generation. The experience of our states, confirmed by independent analyses,¹⁸ finds that sufficiently ambitious renewable energy policies can achieve significant carbon pollution reductions from fossil-fuel fired sources. In addition, these policies can spur

¹² Cal. Public Health and Safety Code § 38550.

¹³ Cal. Exec. Order S-3-05 (June 1, 2005).

¹⁴ See generally Cal. Public Health and Safety Code §§ 38550 *et seq.*

¹⁵ Center for Climate and Energy Solutions, California Global Warming Solutions Act (AB 32), <http://www.c2es.org/us-states-regions/action/california/ab32> (last visited Oct. 22, 2013).

¹⁶ Cal. Air Resources Board analysis, based in part on Cal. Air Resources Board, 2008 to 2012 Emissions for Mandatory Greenhouse Gas Emissions Reporting Summary (2013), <http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2008-2012-ghg-emissions-summary.pdf>. This analysis is preliminary, but reflects California's long-term successes and program performance. Emissions in 2012 were relatively higher than in recent years because of relatively low hydroelectric generation and the unexpected shutdown of the San Onofre Nuclear Generating Station, but the state remains on course to meet emissions targets.

¹⁷ Cal. Air Resources Board analysis.

¹⁸ See e.g., Bryan K. Mignone et al., *Cost-effectiveness and Economic Incidence of a Clean Energy Standard*, Economics of Energy and Environmental Policy, Volume 1, Number 3 (2012); Elizabeth Doris and Rachel Gelman, National Renewable Energy Laboratory, State of the States 2010: The Role of Policy in Clean Energy Market Transformation (2011); Sanya Carley, *State Renewable Energy Electricity Policies: An Empirical Evaluation of Effectiveness*, 37 Energy Policy 3071–3081 (2009).

renewable energy innovation and deployment and promote long-term change toward a cleaner electricity system.

For example, The New York State Energy Research and Development Authority (NYSERDA) estimates that the state's RPS, which requires 30 percent of electricity used by consumers to come from renewables by 2015, avoided 4.1 million tons of CO₂ from 2006 to 2012, along with 4,028 tons of nitrogen oxides (NO_x) and 8,853 tons of sulfur dioxide (SO₂).¹⁹ NYSERDA expects that renewable projects already initiated will inject \$2.7 billion into the state's economy over their operating lives.²⁰

Similarly, Minnesota's Renewable Energy Standard (RES) requires utilities to provide 25 percent of their power from renewables by 2025.²¹ As a result of these policies and market conditions, Minnesota has seen a dramatic increase in wind resources, experiencing a 900 percent growth in wind generation from 2000 to 2010.²² In 2011, wind had grown to provide 12.7 percent of Minnesota's total electricity generation.²³ All Minnesota utilities have met their 2012 RES goals and most ratepayers are benefitting from lower costs.²⁴

Likewise, California has implemented a very aggressive RPS, requiring that 33 percent of state power come from renewable sources by 2020.²⁵ With more than 20 percent of its power already coming from renewable sources, the state is well on its way to meeting that target, and is considering ways to further develop renewable power.

The success of renewable portfolio standards is being demonstrated in many other states across the country as well.²⁶

¹⁹ N.Y. State Energy Research & Development Authority, The New York State Renewable Portfolio Standard Performance Report 19 (2012), <http://www.nyserdera.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/Renewable-Portfolio-Standard-Reports.aspx>.

²⁰ N.Y. State Energy Research & Development Authority, NYSERDA Renewable Portfolio Standard Main Tier 2013 Program Review Final Report September 5 (2013), <http://www.nyserdera.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/Renewable-Portfolio-Standard-Reports.aspx>

²¹ Minn. Stat. 216B.1691 (2013); *see also* Minnesota, DSIRE: Database for State Incentives for Renewable and Efficiency, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MN14R. Xcel Energy, the state's largest utility, must achieve 30 percent from renewables by 2020, one quarter of which must be met with wind.

²² Provided by Minn. Department of Commerce.

²³ Calculated from EIA State Generation, *supra* note 4 (Wind generation as percentage of Total Electricity Power Industry generation).

²⁴ Minn. Dep't. of Commerce, Progress on Compliance by Electric Utilities with the Minnesota Renewable Energy Objective and the Renewable Energy Standard 3, 9 (2013), <http://mn.gov/commerce/energy/images/2013RESLegReport.pdf>.

²⁵ *See generally* RPS Program Overview, Cal. Public Utility Commission, <http://www.cpuc.ca.gov/PUC/energy/Renewables/overview.htm>.

²⁶ *See, e.g.,* World Resources Institute report series, Power Sector Opportunities for Reducing Carbon Dioxide Emissions, which identifies significant projected carbon pollution reductions from renewable strategies in specific states, including Pennsylvania, Michigan, North Carolina, and Ohio. Michael Obeiter et al., World Resources Institute, Power Sector Opportunities for Reducing Carbon Dioxide Emissions, <http://www.wri.org/our-work/project/us-climate-action/publications>.

Energy Efficiency Standards and Programs: State energy efficiency programs and dedicated investments provide some of the most cost-effective opportunities to reduce carbon pollution, reduce electricity costs to rate-payers, increase local economic activity, and create jobs. At least 25 states have energy efficiency resource standards or dedicated funding for energy efficiency established in law. Independent analysis has shown that—when applied across the country—such energy efficiency programs can achieve incremental annual electricity savings in the range of 0.5 to 1 percent annually.²⁷

Experience in some of our states demonstrates that even greater annual savings are achievable. Vermont recorded annual savings of 1.8 percent last year through its Efficiency Vermont program,²⁸ and ISO New England forecasts that New England states' combined programs will effectively flatten projected demand growth through 2022.²⁹ These reductions in electricity use translate into very significant reductions in carbon pollution. For example, Massachusetts projects that its investment in energy efficiency from 2005 through 2015 will reduce Massachusetts' electricity demand by 17.1 percent, resulting in a total annual reduction of 3 million tons of CO₂ in 2015.³⁰

In reducing electricity use, these programs also reduce rate-payer costs. For example, Vermont will see lifetime benefits of \$136.1 million after spending \$57.1 million on energy efficiency through its Efficiency Vermont program. In Colorado Xcel Energy, Colorado's largest utility, anticipates \$227 million in net lifetime economic benefits for its customers as a result of its 2010 demand-side management programs.³¹ California's energy efficiency standards have saved consumers over \$74 billion on their electric bills over their decades of operation.³²

In addition to saving rate-payers on electricity costs, demand-side efficiency programs also represent investment in the local economy and the creation of jobs, by creating positions for those who perform energy efficiency audits or install energy efficiency controls in commercial buildings. Investments in energy efficiency by states participating in RGGI were a large driver

²⁷ Galen L. Barbose et al., Lawrence Berkeley National Laboratory, *The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S.* (2009), http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/LBNL_Shifting_Landscape_of_Ratepayer_Energy_Efficiency_REPORT.pdf (finding savings of 0.4 to 0.9 percent achievable under low to high scenarios).

²⁸ *2012 Annual Highlights*, Efficiency Vermont, http://www.efficiencyvermont.com/about_us/information_reports/annual-highlights-2012.aspx.

²⁹ Presentation, ISO New England, Final 2013 Energy-Efficiency Forecast 2016-2022 at slide 37, http://www.iso-ne.com/committees/comm_wkgrps/othr/enrgy_effncy_frcst/2013frcst/iso_ne_final_ee_forecast_2016_2022.pdf.

³⁰ Provided by Mass. Department of Environmental Protection.

³¹ American Council for an Energy-Efficient Economy, *Energy Efficiency Resource Standards: A Progress Report on State Experience* 12 (June 2011), <http://aceee.org/research-report/u112>. Vermont's \$57.1 million energy efficiency spending includes both Efficiency Vermont and participant spending.

³² Cal. Energy Commission, *Draft 2013 Integrated Energy Policy Report* 23 (2013), <http://www.energy.ca.gov/2013publications/CEC-100-2013-001/CEC-100-2013-001-LCD.pdf>.

for the finding that the RGGI program overall created 16,000 jobs as a result of the first three years of its operation.³³

These tremendous cost savings to rate-payers and economic benefits help make energy efficiency programs among the most cost-effective measures for reducing carbon pollution.

State and Utility Planning Efforts and Programs: State and utility planning efforts and programs, including planned early retirements of inefficient generation resources, are another approach that can significantly drive reductions in carbon pollution.

A prime example is Colorado's Clean Air – Clean Jobs Act, which required the state's regulated utilities to develop plans for reducing air pollutant emissions from coal-fired power plants equaling either 900 MW capacity or 50 percent of their coal fleet. As a result, the state's public utilities commission (PUC) has now approved plans from regulated utilities that will significantly reduce GHG emissions from coal plants, largely through plant retirements.³⁴ Colorado's largest utility, Xcel Energy, anticipates reducing its CO₂ emissions by 28 percent by 2020 under the state's Clean Air – Clean Jobs Act.³⁵

Minnesota's Emission Reductions Rider statute similarly encourages utilities to file plans containing actions that would reduce emissions and that were not already required by federal regulations; the statute then allowed utilities to recover costs for those actions.³⁶ For example, the Minnesota Metro Emissions Reduction Project, completed by Xcel Energy from 2007 to 2009, reduced carbon emissions from three Twin Cities area power projects by 21 percent through the replacement of two coal facilities with highly efficient combined cycle units and the rehabilitation of an existing coal unit.³⁷

Carbon Capture and Sequestration Programs and Policies: State projects and policies to support carbon capture and sequestration for coal plants can play an important role in achieving reductions from the existing fossil fleet. For example, Illinois has supported the development of clean coal projects through the FutureGen project in conjunction with the U.S. Department of Energy.³⁸ Illinois also passed the Clean Coal Portfolio Standard Law, which requires new coal-

³³ Jobs are "job years," or one job sustained for one year. The Analysis Group, *The Economic Impacts of the Regional Greenhouse Gas Initiative* 47 (2011),

http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf.

³⁴ See Press Release, Gov. Ritter, Bipartisan Lawmakers & Coalition Introduce Colorado Clean Air-Clean Jobs Legislation (Mar. 16, 2010),

<http://www.colorado.gov/cs/Satellite%3Fc%3DPage%26childpagename%3DGovRitter%252FGOVRLayout%26cid%3D1251573201310%26pagename%3DGOVRWrapper>.

³⁵ Xcel Energy, *Colorado Clean Air – Clean Jobs Plan*,

[http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/Colorado_Clean_Air - Clean_Jobs_Plan](http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/Colorado_Clean_Air_-_Clean_Jobs_Plan) (reductions presumed from a 2010 baseline).

³⁶ Minn. Stat. § 216B.1692 (2013).

³⁷ Minn. Public Utility Commission, *Report to the Legislature on Emission Reduction Projects Under Minnesota Statutes 216B.1692* (2008), http://www.puc.state.mn.us/portal/groups/public/documents/pdf_files/000661.pdf; *Minnesota Metro Emissions Reduction Project*, Xcel Energy,

http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/MN_MERP.

³⁸ See FutureGen Alliance, <http://www.futuregenalliance.org>.

fired power plants to capture and store more than half of the carbon emissions that the facility would otherwise emit.³⁹

Combined Heat and Power Incentives: Combined heat and power (CHP)—also known as cogeneration—is an efficient, clean, and reliable way to generate electricity and heat from a single fuel source. Commercial and industrial facilities installing CHP systems can reduce load, peak demand, and associated carbon dioxide emissions from the grid by cost effectively generating their own electricity with low-emitting technologies such as fuel cells, natural gas microturbines, and gas turbines with waste heat recovery boilers. Installing CHP systems can significantly increase operational efficiency while lowering energy costs and reducing overall emissions from the electricity sector.

States can play an important role in promoting CHP. For example, Connecticut has implemented a variety of programs to promote CHP including construction grants, standardization of interconnection protocols, low interest loans, and the establishment of a CHP portfolio standard. As a result, Connecticut industry has added more than 91 MW of CHP capacity between 2005 and 2011.⁴⁰

State New Source Performance Standards: California, New York, Oregon, and Washington all have state emission performance standards for new power plants that have required new facilities to be highly efficient.⁴¹

The nation as a whole has also made important reductions in carbon pollution emissions, especially in very recent years, due to a variety of factors, including programs to reduce emissions of other pollutants from the power sector (e.g., mercury, nitrogen oxides, and sulfur dioxide), the increased availability and lower cost of natural gas, and growing efforts to secure the benefits of energy efficiency and renewable power. Overall carbon pollution from the electric power sector fell by 10.1 percent from 2005 to 2011, and the net emission rate for the power sector as a whole improved 11.1 percent from 1390 to 1236 lbs CO₂/MWh.⁴² Separate data available for most recent years show that these improvements have accelerated; in the last three years alone, from 2010 to 2012, emissions from the power sector in the United States fell by 10.3 percent.⁴³

³⁹ 20 Ill. Comp. Stat. 3855/1-10 (2013).

⁴⁰ Conn. Department of Energy and Environmental Protection, 2013 Conn. Comprehensive Energy Strategy (2013), http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf

⁴¹ Cal. Pub. Util. Code §§ 8340-41 (2013), SB 1368 Perata (2006); Or. SB 101 (2000); N.Y. Comp. Codes R. & Regs. tit. 6 Part 251 (2013); Wash. Rev. Code ch. 80.80 (2013), Wash. SB 6001 (2007).

⁴² Calculated from U.S. Energy Information Administration data. CO₂ emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources EIA State Generation, *supra* note 4.

⁴³ *Power Plants*, Greenhouse Gas Reporting Program 2012, U.S. Environmental Protection Agency, <http://www.epa.gov/ghgreporting/ghgdata/reported/powerplants.html>.

III. EPA Should Draw on the Experiences of States in Identifying the Best System of Emission Reduction and in Setting the Performance Level Through a System-Wide Approach

As we discuss above, states are achieving very significant carbon pollution reductions through a variety of state programs, including emission budget and trading programs, renewable portfolio standards, energy efficiency programs, state statutes that require or promote planned electricity resource changes, and others. Implementation of these programs across our states is driving changes to the electricity system as a whole, promoting efficiency improvements at individual sources, using a cleaner mix of our existing fossil fuel-fired sources to meet our electricity needs, adding additional renewable power and other zero-carbon energy capacity, and reducing our overall demand for energy through efficiency.

As EPA designs its Section 111(d) carbon pollution emission guideline for states on the basis of the “best system of emission reduction,”⁴⁴ it should take into account all of these types of demonstrated successes and the carbon pollution reductions achievable by them. Only by considering reductions from all of these types of approaches will EPA be able to establish a standard that achieves the most meaningful, cost-effective reductions.

The state programs can be grouped into three categories of approaches (as identified by EPA in its questions), each of which can secure a distinct pool of emission reductions:

- 1. Changes at individual covered sources to reduce carbon emission intensity.**
These include improving plant efficiency or heat rate, as well as switching to or co-firing with lower carbon fuels. Market-based programs can help drive these types of improvements. Programs and incentives for combined heat and power generation that is more carbon efficient than grid power can also increase the overall efficiency of energy generation. Carbon capture and sequestration can also reduce emissions at individual sources. Other potential on-site improvements that can be used to reduce emissions include: using renewable energy to provide supplemental steam heating; using waste heat to remove moisture from coal; implementing advanced systems for combustion and dispatch optimization, or oxy-combustion systems, and others.⁴⁵
- 2. Shifts in generation from covered sources that have higher carbon-pollution emission rates to others that have lower carbon-pollution emission rates.** This includes increasing generation at highly efficient natural gas plants and replacing existing sources with such efficient sources. Market-based state programs are demonstrating the effectiveness of these types of shifts across the electricity system, because sources that have lower carbon emission rates can provide electricity at a lower

⁴⁴ See 42 U.S.C. § 7411(a)(1).

⁴⁵ See Megan Ceronsky and Tomas Carbonell, Environmental Defense Fund, Section 111(d) of the Clean Air Act, The Legal Foundation for Strong, Flexible & Cost-Effective Carbon Pollution Standards for Existing Power Plants 11 (2013), <http://blogs.edf.org/climate411/files/2013/10/Section-111d-of-the-Clean-Air-Act-The-Legal-Foundation-for-Strong-Flexible-Cost-Effective-Carbon-Pollution-Standards-for-Existing-Power-Plants-O.pdf>.

compliance cost. State new source performance standards have also driven such improvements, as they have required replacement generation to meet emission standards.

3. **Reduction of emissions from covered sources through displacement by zero-carbon generation or reduction in electricity demand.** This category covers two different approaches, both of which have the effect of displacing generation from covered fossil-fuel fired power plants thereby reducing carbon pollution from those sources. Developing additional zero-carbon electricity generation capacity, for example by adding wind and solar energy resources as well as nuclear power,⁴⁶ can reduce the use of carbon-emitting electricity resources.

Another approach is to reduce the overall need for electricity through demand-side energy efficiency measures, such as through more efficient lights and appliances, and better residential and commercial building efficiency. Market-based programs, renewable energy standards, and state demand-side energy efficiency standards and programs are all demonstrating the types of emission reductions that can be achieved from covered sources through this category of reductions.

Our experience has demonstrated that meaningful, cost-effective emission reductions are best achieved through a system-wide approach that draws from all three of these strategies.

In particular, state experience has demonstrated that the most cost-effective strategies resulting in meaningful reductions are those that promote shifts away from high-emission fossil sources, displace emissions with zero-carbon generation, or reduce electricity use through demand-side efficiency programs.

In contrast, more limited emission reductions are available from plant-level efficiency improvements, as demonstrated by the extensive technical analysis in EPA's proposed new source standards for the sector.⁴⁷ Meaningful reductions could be achieved at a reasonable cost if the full range of available on-site systems, including efficiency upgrades and other improvements, were applied to each source,⁴⁸ except those nearing the end of their remaining useful life. However, we believe that such an approach is less cost-effective, and less effective in promoting long-term improvements in the electricity system, than a system-wide approach as described above and as demonstrated in our states.

⁴⁶ Nuclear energy capacity can be increased through facility upgrades or construction of generation stations.

⁴⁷ U.S. Environmental Protection Agency, Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units, EPA-HQ-OAR-2013-0495, at 27 (Sept. 20, 2013), <http://www2.epa.gov/sites/production/files/2013-09/documents/20130920proposal.pdf>. We do note, however, that source-level programs which directly and significantly reduce the capacity factor (and hence emissions) of inefficient or aging fossil plants, or use similar approaches to limit such plants' continued operations, may achieve substantial reductions.

⁴⁸ Such improvement could include the full range of options described under the "Changes at individual covered sources to reduce carbon emission intensity" category above, but opportunities for application of some of the individual strategies may vary by source. See discussion *supra* note 45.

The best emission reduction systems focus on shifting the grid as a whole away from high-carbon sources because individual generating units do not operate independently. Instead, they are part of a system of highly interdependent sources whose aggregate emissions are dependent on system management.⁴⁹ As state experience has shown, reducing demand for fossil generation or providing alternative, cleaner, sources of supply achieves emissions reductions far beyond the level that can be achieved by improving the operations of individual fossil plants.

Grid-level programs of this sort have delivered major economic benefits along with environmental improvements. In California, for instance, expanding energy efficiency alone has saved ratepayers billions of dollars while reducing the need for new power plants. The RGGI states are adding thousands of jobs as a result of these efforts, while cutting emissions. Similarly, state efforts to add renewable power across the country have improved the fuel diversity and system performance of the grid, while supporting a national boom in clean energy jobs. These opportunities are not available from strategies which focus only on source-level reductions, which are necessarily more limited and so provide fewer opportunities to save energy and create jobs.

Indeed, one of the Clean Air Act's most notable successes—the Acid Rain Program—achieved tremendous pollution reductions through a grid-level approach, promoting trading between generation sources to reduce emissions from the fleet as a whole, rather than focusing narrowly on individual sources.⁵⁰ That effort cut acid gases from power plants in the program by more than 70 percent in an extremely cost-effective way, leading EPA to conclude that “market-based trading systems can cost-effectively reduce pollution and address environmental damage.”⁵¹ Related programs have further cut pollution by providing incentives to move the grid, as a whole, toward cleaner energy.⁵² We agree with EPA that these system-level approaches,⁵³ including efforts to integrate renewable energy and energy efficiency into the grid, “represent ... a real opportunity” to reduce air pollution.⁵⁴

EPA needs to seize that opportunity because Section 111(d) standards are to be based on the “best system of emission reduction,”⁵⁵ and the best systems available include all three carbon reduction strategies the states have demonstrated. The courts are clear that EPA must “weigh cost, energy, and environmental impacts in the broadest sense at the national and regional

⁴⁹ See U.S. Environmental Protection Agency, Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans at Appendix B, B-6 (2012) [hereinafter EPA EE/RE Roadmap].

⁵⁰ See generally 42 U.S.C. §§ 7651 *et seq.*

⁵¹ U.S. Environmental Protection Agency, Acid Rain and Related Programs 2009 Highlights: 15 Years of Results (2009), http://www.epa.gov/airmarkets/progress/ARP09_4.html.

⁵² See, e.g., NO_x SIP Call, 63 Fed. Reg. 57,356 (Oct. 27, 1998); Clean Air Interstate Rule, 70 Fed. Reg. 25,162 (May 12, 2005).

⁵³ See also Clean Air Mercury Rule, 69 Fed. Reg. 4,652, 4,698-4,705 (proposed Jan. 30, 2004) (discussing benefits of allowance system for pollution reduction from the electric power sector while proposing Section 111(d) guidelines for the sector).

⁵⁴ EPA EE/RE Roadmap, *supra* note 49, at 12.

⁵⁵ 42 U.S.C. §§ 7411(a)(1) & (d)(1) (emphasis added); see also 40 C.F.R. §§ 60.21(e), 60.22(b)(5).

levels and over time as opposed to simply at the plant level in the immediate present” as it seeks the best ways to reduce emissions.⁵⁶ We are confident that a broad approach is the best path forward here.

Indeed, EPA has recently developed a “Roadmap” that outlines system-level approaches for states seeking to reduce fossil fleet emissions in order to maintain compliance with air quality standards for pollutants like ozone and soot.⁵⁷ The Roadmap discusses all three of our strategies, including energy efficiency programs, emissions trading systems, and renewable portfolio standards which can help reduce grid-level emissions. Those same strategies work to reduce greenhouse gas pollution as well.

EPA must therefore look broadly to ensure that it fully accounts for emission reduction opportunities across the electric system, from individual generation stations to the grid as a whole. Simply put, achieving meaningful, cost-effective emission reductions across the power grid requires taking a grid-level perspective, as states’ experience demonstrates. That experience shows carbon pollution reductions in the range of 17 to 46 percent over a seven year period (2005-2011) have been achieved by many leading states,⁵⁸ along with related improvements in emission rates from 18 to 39 percent in the same time frame, demonstrating that such broad policies can successfully and cost-effectively achieve real progress.⁵⁹

⁵⁶ *Sierra Club v. Costle*, 657 F.2d 298, 330 (D.C. Cir. 1981).

⁵⁷ See generally EPA EE/RE Roadmap, *supra* note 49.

⁵⁸ Represents range of reductions achieved by Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Vermont, and Washington. Calculated from U.S. Energy Information Administration data. CO₂ emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4.

⁵⁹ Represents range of reductions achieved by Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New York, and Oregon. Calculated from U.S. Energy Information Administration data. CO₂ emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources EIA State Generation, *supra* note 4.

IV. The Form of EPA's Emission Guidelines Should Recognize Different State Starting Points and Support the Use of State Programs for Compliance

IV.A. The Emission Guideline Should Equitably Recognize States' Different Starting Points and Circumstances

States all across the country can take advantage of the strategies we discuss above to reduce their carbon pollution to a significantly lower level, but will begin with widely differing power fleets and existing regulatory initiatives. EPA should balance these differences with the need to reduce greenhouse gas emissions across the country by placing all states on a trajectory to achieve a uniformly rigorous target, while allowing varying compliance times (recognizing that this period of time may extend beyond an initial phase covered by the rulemaking).

One approach that EPA should consider is setting a single emission intensity target that would apply to each state, individually or as part of a region, representing net improvements to the carbon intensity of a state's electricity system that could be achieved through the system-wide approaches described above. (This target could be expressed as an aggregate emission rate of pounds per megawatt-hour or potentially as a rate of emissions per gross domestic product). States that would have further to go to meet the target could have longer compliance times to meet the common goal. This approach would require all states to reduce emissions while being equitable to states that have already made progress toward meeting the emission intensity target. The same goal would be achieved by establishing a mass-based emission budget for each state that reflects a level of aggregate emissions from covered sources commensurate with full use of the best system of emission reductions. (We discuss ways to convert between mass and rate standards below.)

Approaches like these would automatically recognize the substantial emission reductions achieved by first-mover states while providing other states the time they need to pursue these opportunities. States that have already taken significant action to reduce carbon pollution or already have mostly low-carbon energy resources would be on track to meet such common standards quickly, with fewer opportunities for immediate further improvements beyond those already contemplated in their programs. States that have a high-carbon energy portfolio may have greater opportunities to achieve significant reductions in the near term through actions that other states may have already taken, but may require more time to reach the same level of overall emission performance as states that have already taken significant action.

Reviewing state programs within this framework, EPA would ensure that each state has designed its program to put regulated sources on an achievable glide path to reach its target as soon as practicable,⁶⁰ thereby maintaining a clear regulatory incentive to reduce carbon dioxide emissions over the compliance period.

EPA has taken these approaches in the past: other Clean Air Act programs allow states time to comply, with the time period depending on the degree of pollution reduction required and a

⁶⁰ States would need to support through analysis that the "glidepath" demonstrates reasonable progress toward the target.

showing of “reasonable progress” towards final standards.⁶¹ EPA’s Section 111(d) general regulations likewise support this approach, as they anticipate that state plans will set compliance schedules that include regular progress reports.⁶²

We believe this approach, which focuses on moving states toward a shared endpoint, is substantially better than one based on requiring percentage reductions (either in tons or rates) from a particular baseline year. Setting an equitable baseline across the states, which have varying economic and emissions histories, would be difficult and time-consuming. And because states have very different emissions levels now, requiring all states to reduce emissions by the same percentage across the board, regardless of starting circumstances, would not treat the states equitably, or be the most cost-effective way of achieving reductions.⁶³

We recognize that other equity issues will arise as EPA considers how to move the states towards a common target. These include the fact that states may be net importers or exporters of power, and so their emissions may be affected by actions in other states that they cannot directly control. On a related point, some states may have relatively smaller in-state power systems, and so may have limited opportunity for system-wide improvements within the state. We believe that encouraging regional 111(d) planning, as we discuss later in these comments, may help address these issues.

IV.B. EPA Should Provide a Durable Regulatory Signal for Further Emissions Reductions

The 111(d) guidelines should send a durable regulatory signal that greenhouse gas pollution from the power sector must be significantly reduced, and that further reductions will be required as systems of emission reduction further improve. Sending that signal requires setting meaningful endpoints for states to reach during the initial compliance period, and committing to regularly review (and, in all likelihood tighten) the guidelines over time.

Although we recognize that states may reach these endpoints at different times, it is important the standards be clear that the endpoints, once reached, are ceilings. Emissions levels (whether set as mass ceilings or maximum emissions rates) cannot be allowed to rise above the target after the end of the initial compliance period.

EPA should further ensure that it is clear to the regulated industry that further reductions are likely in the future. The reduction opportunities available with current adequately demonstrated systems will expand down the road as further deployment of existing clean technologies takes place. EPA should be clear that it will be regularly revisiting its guidelines to assess new pollution control opportunities.

⁶¹ See, e.g., 42 U.S.C. § 7410 (state plans for criteria pollutants); 42 U.S.C. § 7491(b) (plans need to make “reasonable progress” toward visibility improvements).

⁶² See 40 C.F.R. §§ 60.24(a) & 60.25(e).

⁶³ If EPA nonetheless chooses to pursue the approach of requiring all states to achieve a percentage reduction from a baseline year, it should provide states with the option of utilizing an earlier baseline that would recognize the progress that they have already achieved. It would also be important for EPA to recognize the relationship between the baseline year and current reductions already achieved for the purpose of setting the performance level. For example, if EPA were to select 2005 as a baseline year, it should recognize that 2011 emissions nationwide are already 11 percent below 2005 emissions, and the average power sector emissions rate in 2011 is 11 percent below the emission rate in 2005. See discussion *supra* at notes 42, 43.

In particular, Section 111 and its implementing regulations already specify that EPA will review, and if appropriate, revise its *new* source regulations every eight years,⁶⁴ and that it will publish draft and final existing source guidelines “[c]oncurrently upon or after” proposing new source standards.⁶⁵ Although the rules thus anticipate revisions, EPA should further clarify this review obligation. It should do so by providing, by rule, that it will review and, if appropriate, revise, its existing source standards by a date certain, on the same eight-year timeline as applies to its new source standards – a sensible provision that will allow EPA to evaluate the power fleet as a whole in each review.

Such regulatory deadlines are not unusual. In the greenhouse gas context, for instance, EPA included enforceable deadlines in its “tailoring” rule for major source permitting, requiring the agency to regularly revisit its rulemaking over time, as greenhouse gas regulation experience is gained.⁶⁶ A similar course is appropriate here. A review commitment will make clear to all parties that the emissions glide paths will continue to decline long after the first compliance period has passed.

IV.C. Emission Guideline Should Provide a Mass-Based Performance Level Option

Many current state greenhouse gas reduction programs, including the programs of states participating in RGGI and the California system, are based on limiting emissions to an overall quantity expressed as a mass (e.g., tons of CO₂). To ensure that these programs can continue to operate smoothly to support compliance with the Section 111(d) rules, EPA should provide for a mass-based emission budget compliance option, either by articulating the standard as a mass-based emission budget, or providing a mechanism for translating from a rate-based standard to a mass-based emission budget.

Such a methodology could apply an emission rate to the projected or historic generation from covered power plants in a state. For example, under a projected generation approach, modeling would be used to project how a state’s generation from covered sources would change over a period of time, and then the EPA emission rate would be applied to that projected quantity of electricity generated.⁶⁷ Using such an approach would take into account changes in demand, and would therefore be more comparable to using a rate-based standard, where the emissions are proportionate to demand. EPA could require states to reduce or offset the projected demand growth with readily available energy efficiency improvements (e.g., one percent annually). This approach could potentially involve a “true-up” as well—a review of whether actual changes in

⁶⁴ 42 U.S.C. § 7411(b)(1)(B).

⁶⁵ 40 C.F.R. § 60.22(a).

⁶⁶ See 40 C.F.R. § 50.22.

⁶⁷ Under such an approach, it would be appropriate to require new sources to be subject to the new source standard as part of their New Source Performance Standard compliance obligation, as using projected generation to compute a state’s emission budget would inherently reflect any new generation required to meet changes in load. Such an approach was proposed by EPA in the Clean Air Mercury Rule. 70 Fed. Reg. 28622 (May 18, 2005).

demand and related factors are consistent with projected changes, and a potential adjustment to the budget to reflect those changes.⁶⁸

If a historic generation approach is used, a state's emission budget would be based on the amount of emissions that would have occurred in a baseline year if the state's power plants had generated the same amount of electricity as they did during the baseline year, but had emitted at a target emission rate.⁶⁹

Note that under these approaches, the emission budget would represent an aggregate budget for all covered sources in a state. States choosing to use the emission budget would be required to meet the standard in the aggregate, could use all cost-effective measures—such as efficiency, renewables, end-use controls, carbon capture and sequestration—to obtain the necessary reductions, and could allow averaging of emissions or trading of emissions allowances. Or a state could join a regional market-based program, and could demonstrate compliance if the group of states collectively met the states' aggregate mass-based standard.

If EPA articulates the standard as a rate-based standard, and if EPA's methodology for translating from a rate-based standard to a mass-based standard involves accounting for projected changes in generation from covered sources, the methodology should be transparent and consistent. The methodology should start with reliable, existing federal data sources, including the Clean Air Markets Division emissions database and the EIA Annual Energy Outlook. EPA should also allow states to seek to use their own data, but EPA should require states to rigorously substantiate any changes to projections based on other, non-federal data sources.⁷⁰

IV.D. Emission Guideline Should Recognize that Averaging or Trading Elements Necessarily Take into Account Remaining Useful Life

Section 111(d) requires EPA to allow a state, in applying a standard of performance to any particular source, to take into consideration the remaining useful life of the existing source to which the standard applies.⁷¹

⁶⁸ A system-wide approach to reducing emissions includes reducing electricity demand through energy efficiency or displacing demand for fossil fuel-fired generation through additional zero-carbon energy. Therefore any projection of demand change or "true-up" should reflect those anticipated electricity savings or displacement.

⁶⁹ For a simplified example, assume that the standard is 1100 lbs/MWh (the proposed rate for new coal plants), and that state "X" has one gas plant and one coal plant, each of 500 MW. In the hypothetical base year of 2013, the gas and coal plant together generate 7 million MWh of electricity and emit 5.2 million tons of CO₂, at an average 2013 rate of 1500 lbs/MWh. The state's cap in 2025 would assume the same generation--7 million MWh—and multiply that by the 2025 rate-based standard-- 1100 lbs/MWh. This yields a cap of 3.8 million tons per year, 27 percent less than actual emissions in 2013. Note that this method could be adapted to accommodate different rates for different fuels or plant types, such as those proposed in the new plant standard.

⁷⁰ EPA should consider providing guidance for how a state can provide a rigorous demonstration of changes from specific factors, for example if a state is projecting significant increases in electricity demand due to increased electric vehicle deployment as a result of state policies that are not reflected in federal projections.

⁷¹ 42 U.S.C. § 7411(d)(1).

Programs that include averaging and trading inherently take into account remaining useful life, as they allow market participants to make decisions about operations based on market prices. The owners of an older, inefficient facility nearing retirement need not choose between significant modifications to continue operating for only a few years or immediate retirement; instead the owners of such a facility could choose to continue to operate for several years and comply through the purchase of allowances or through averaging emissions with more efficient facilities. In this way, regulated entities may continue to operate facilities that would not be economically feasible to operate if emission reductions were required from each facility, but are economically feasible to operate under a market-based program. In a market-based or averaging program, EPA should consider that allowing states to elect such mechanisms is one way to allow states to take into consideration remaining useful life.

EPA should also consider an option for states without such averaging or trading systems to treat specific facilities separately, for example, if those facilities enter into a legally enforceable agreement to retire by a certain date. If a facility commits to retire during the compliance period, a state might not require it to take all the regulatory steps that would be necessary to reduce its emissions to the level required at the end of that period, because the source will no longer be operating.

For states that use a mass-based approach on a system-wide basis, consideration of useful life could support a declining cap on emissions. For example, a system-wide cap could, over time, decline to a level that corresponds to the emission level of new fossil-fired plants, as higher-emitting existing sources are assumed to retire at the end of their useful lives. Of course, the market signals would determine whether those aging systems actually retire or whether the required emission reductions would be achieved from other plants reducing their generation.

V. EPA Should Allow for a Variety of Rigorous State Compliance Options

V.A. EPA Emission Guidelines Should Allow States to Use Effective Current Programs

As we have discussed above, the states have developed a wide array of emissions reductions programs that are now operating. EPA should incorporate into its “Best System of Emission Reduction” determination all of the approaches that states are already demonstrating achieve cost-effective, meaningful reductions from covered sources, including reductions from onsite improvements, shifts in generation among covered sources, and displacement from zero-carbon generation increases or demand-side efficiency. Even if EPA does not explicitly base the “best system of reduction” on the variety of state programs described above, EPA should allow states with any effective existing programs the option of using these programs as the basis of compliance as long as states can demonstrate through a rigorous, consistent methodology identified by EPA that those programs will achieve the required reductions.

States managing greenhouse gas reduction, energy efficiency, and renewable energy programs have built these programs through their own democratic and stakeholder processes, and with a deep understanding of conditions within their power grids. To the extent that those programs are delivering a substantial portion of the reductions needed to comply with Section 111(d) guidelines, EPA should ensure that its federal framework provides states with the option of incorporating their current programs with minimal change or burden as long as they achieve equivalent reductions. As its governing regulations require, EPA has regularly invited the states to propose a range of approaches to meet federal standards, in whole or in part, and we expect it to follow the same course here.⁷²

⁷² See, e.g., Emission Guidelines for Municipal Waste Combustors, 60 Fed. Reg. 65,837, 65,402 (Dec. 19, 1995) (111(d) rules for municipal waste combustors, inviting states to submit trading plans to meet federal standards); Clean Air Mercury Rule, 70 Fed. Reg. 28,606, 28,619 (May 18, 2005) (allowing states to develop their own plans to comply with power plant Section 111(d) standards); Clean Air Mercury Rule, 69 Fed. Reg. 12,398, 12,406 (supplemental proposed Mar. 16, 2004) (allowing states to develop their own plans to comply with power plant Section 111(d) standards).

V.B. EPA Should Allow and Promote Interstate Cooperation and Regional Programs

Many existing programs already have a regional component, and others may well incorporate one. EPA should encourage interstate coordination and collaboration, recognizing that the electricity system is a complex, interstate system, and that allowing interstate coordination and collaboration can reduce costs and help avoid challenges that arise when limiting systems to a specific state. Interstate cooperation can also lower the administrative burden on states and compliance entities, and helps to resolve equity issues that might otherwise arise between power-exporting and power-importing states.

Interstate programs have already been successful in a variety of contexts. On a national basis, as we have noted above, EPA has promoted multi-state trading systems through its Acid Rain Program and Cross-State Air Pollution Rule, as well as efforts to decrease regional haze and to address ozone transport issues between and among the states.⁷³ These programs are frequently identified as being highly cost-effective.⁷⁴

RGGI is a prime example of how an interstate program helps to ensure that the most cost-effective emission reductions occur across the region. Since the program began, coal-fired plants closed within the RGGI region and the capacity of those plants was replaced by increased generation from cleaner and more efficient renewable and natural gas powered sources elsewhere in the region. Indeed, emissions in at least one state actually increased, because that state is the location of some of the more efficient natural gas-fired power plants in the region that had excess capacity.

As RGGI demonstrates, a program that corresponds with or is more closely aligned with the borders of an electricity grid (for example, among states in the same NERC interconnections or regional transmission organizations) is potentially more efficient than programs that are constrained by state borders.

A regional program can also avoid market distortions that would result in less than optimal policy decisions due to some of the interstate issues raised by EPA in its questions. For example, if one state's energy efficiency investments reduce emissions in a neighboring state, a regional program that encompasses both states would be able to reap the emission reduction benefits of that energy efficiency under a regional emissions cap.

⁷³ Acid Rain Program, Clean Air Act Title IV, 42 U.S.C. §§ 7651-7651o; 40 C.F.R. Parts 72-28 (Acid Rain Program implementing regulations, establishing interstate trading program); Cross State Air Pollution Rule, 76 Fed. Reg. 48208, 48210 (Aug. 8, 2011) (establishing state trading programs that allow interstate trading); Regional Haze Regulations, 64 Fed. Reg. 35,714, 35,715 (July 1, 1999) (allowing multi-state approaches to controlling regional haze); *Overview of the Ozone Transport Commission NO_x Budget Program*, U.S. Environmental Protection Agency, <http://www.epa.gov/AIRMARKET/progsregs/nox/otc-overview.html> (describing Northeastern states implementation of NO_x budget trading program); NO_x SIP Call, 63 Fed. Reg. 57,359 (Oct. 27, 1998) (establishing recommended multi-state budget trading program to control ozone precursor NO_x).

⁷⁴ See, e.g., William F. Pederson, *Should EPA Use Emissions Averaging or Cap and Trade to Implement §111(d) of the Clean Air Act?*, 34 Env. L Rptr. 10731 (2013).

V.C. EPA Should Provide Guidance on How to Address Interstate Issues such as Double-Counting.

Regional collaboration on state Section 111(d) plans can directly address double-counting, either through coordination of compliance systems or through agreements on how to address any double-counting problems. In order to promote such regional cooperation, EPA and DOE should make available information about regional electricity flows and interstate impacts of state programs and policies. EPA should consider providing guidance on how states can collaborate regionally on implementation plans. For example, EPA should allow states using mass-based emission budgets to “pool” emission budgets, and to demonstrate how their state plans will jointly achieve an aggregated emission budget.

But not all states may opt to join regional plans, and clear accounting will be important between and among different regions.

EPA should also provide guidance on how it will address complications that may arise due to the use of different types of state programs. Such complications include situations where one state proposes a program that would achieve reductions through the displacement of fossil fuel generation due to the state’s renewable portfolio standards, long-term power purchase agreements, energy efficiency resource standards, or similar state policies, but where the actual reduction of emissions from fossil generation takes place in another state. If EPA provides a state with credit from emission reductions occurring outside its borders, EPA must establish a process for ensuring that states that see their emissions reduced as a result exclude the resulting emissions reductions from their compliance demonstration. A similar situation would arise when a state seeks compliance through planned shut-downs of fossil fuel generation, but then would see that generation replaced by increased carbon generation in another state.

V.D. EPA Should Work with States to Develop Compliance Pathways and Model Rules

To help states develop state-level and regional plans, EPA should work with states to develop compliance pathways for existing programs, for example by developing model State Plans in collaboration with states or making clear that model State Plans developed by states are approvable. (See section VII below for proposed RGGI and State Portfolio compliance pathways).

As part of this work, EPA should develop a procedure for allowing states to demonstrate equivalency with the emission guideline, even if EPA does not explicitly contemplate a state’s program type in a model rule. Such a procedure should ensure that equivalent reductions will be achieved through the use of consistent evaluation and quantification methods, as discussed below.

In order to meet the timetable in the Presidential Memorandum requiring states to submit plans by June 30, 2016, EPA should provide a clear indication that it expects certain compliance pathways to be approvable prior to its publication of the final rule by July 1, 2015.

V.E. EPA Should Ensure Consistent Evaluation and Quantification of State Plans

Accommodating a range of state and regional program designs will require EPA to provide program evaluation metrics along with the draft guidelines. Those metrics should offer a transparent, nationally consistent, and readily usable way for states to evaluate their existing programs to determine whether they suffice to comply with the guideline’s emissions level, or if additional reductions will be required. By setting out these goal posts early, EPA will make it

easier for states to quickly advance strong programs through the Section 111(d) process, and to identify ways to improve weaker ones.

EPA should build on current program evaluation guidance such as the “Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans”⁷⁵ or the State and Local Energy Efficiency Action Network’s “Energy Efficiency Program Impact Evaluation Guide.”⁷⁶ These guides describe the terminology, structures, and approaches used for evaluating energy and demand savings as well as methods for calculating avoided emissions and other non-energy benefits resulting from energy efficiency programs that are implemented by local governments, states, utilities, private companies, and nonprofits. They provide context, planning guidance, and discussion of issues that help illustrate appropriate evaluation objectives and approaches for different efficiency portfolios. By promoting the use of standard evaluation terminology and structures and approaches, evaluations can support the adoption, continuation, and expansion of effective efficiency actions for consistent inclusion in State Plans. EPA and DOE should continue to work with state and local energy and environmental agencies to ensure that renewable energy and energy efficiency programs are evaluated transparently and consistently so that appropriate credit is provided for these programs.

Energy efficiency evaluation methodologies are particularly important for programs ranging from LED lighting replacement to combined heat and power projects. Consistent quantification methodologies are needed for projecting reductions in energy use as part of a baseline energy use forecast and for calculating reductions documented after-the-fact as part of a compliance effort.

⁷⁵ EPA EE/RE Roadmap, *supra* note 49.

⁷⁶ State and Local Energy Efficiency Action Network, Energy Efficiency Program Impact Evaluation Guide (2012), www1.eere.energy.gov/seeaction/impactguide.

V.F. EPA Should Coordinate Efforts with Other Relevant Federal and State Agencies

Implementing the guidelines will be a collaborative effort between and among numerous federal and regional entities, as well as with the states. We trust that EPA will work particularly closely with federal and state energy regulators, including the Federal Energy Regulatory Commission (FERC), the Department of Energy (DOE), and through the National Association of Regulatory Utility Commissioners (NARUC), state utility regulators, as well as regional grid operators and reliability coordinators. This work will be critical to developing durable system-level standards and accessing state plans employing a variety of policies that may affect the grid. Strong collaboration between EPA and the energy regulators will also be important to make sure that these entities provide maximum support to states investing in emissions controls, by ensuring that energy markets are designed and operated in a way that ensures that clean energy investments are fully valued and able to participate.

Initially, we urge EPA to work particularly closely with DOE in order to develop clear evaluation metrics and modeling tools that EPA and the states can use to assess their various grid-level programs against the level of the emission guidelines, and to assess compliance pathways. As these programs move forward, EPA should also work with FERC and regional grid entities to ensure that reliability-related issues are addressed early in the process, without delaying Section 111(d)'s implementation, just as EPA has done during other Clean Air Act rulemakings. FERC's recent Order 1000, which is helping to integrate public policy mandates into grid planning, should help with this process by enabling measures that complement and support states' emission reduction strategies. EPA should work with FERC, the grid operators, and the states to ensure that the effects of Section 111(d) plans are accounted for in planning early and that any necessary costs are allocated equitably to the affected parties. It will be important for the regional and inter-regional grid plans to be able to account for changes driven by Section 111, and to properly allocate any resulting costs.

FERC should also support transmission upgrades that facilitate increased reliance on renewable generation.

States will also need help from federal energy regulators to properly deploy their plans. We trust the energy regulators will help states assess the effects of their policy proposals, and to design effective grid-related programs, and ask that EPA help to coordinate efforts in this direction. Likewise, it is vitally important that federal programs not present unnecessary impediments to state efforts. All members of the federal family should support ambitious carbon pollution reduction efforts. We remain concerned, for instance, that the Federal Housing Finance Agency continues to complicate financing for the Property Assessed Clean Energy (PACE) program, which should be providing a ready funding stream to help further clean energy improvements. EPA, working with the White House Council on Environmental Quality and other federal coordinating bodies, should ensure that the states do not face conflicting federal messages as they work to reduce carbon pollution.

VI. Specific Compliance Models that EPA Should Work with States to Develop

VI.A. Regional Budget Trading Programs as a Compliance Pathway

EPA's guidelines should recognize the regional nature of electrical grids by allowing participating states to demonstrate compliance with Section 111(d) guidelines on a regional basis.

In a regional budget trading program, overall emissions are capped and sources comply by holding emission allowances equal to their emissions. Individual states participating in a regional program may also reduce emissions through a variety of state-specific energy programs like renewable portfolio standards and energy efficiency programs. The regional emission cap can operate as an umbrella, encompassing and accounting for the emission reductions from these complementary programs. Because overall emissions are limited by the emissions cap, the complementary programs would not need to be federally enforceable. The complementary programs also serve to reduce the cost of complying with the regional emissions cap. RGGI offers one example of this approach.

Under Section 111(d), the states in the regional budget trading program could be given the option of demonstrating in each of their individual state plans that the overall regional emissions cap—which is made up of each individual state's emission budget—collectively meets EPA's standard for the region as a whole. As long as the overall regional emissions cap complies with the guidelines, it should be immaterial to EPA how the participating states elect to apportion the regional emissions cap among the states. Likewise, although a particular state's actual emissions could theoretically exceed its individual state emission budget in a particular year, this should not affect EPA's ability to accept a regional program as a pathway for compliance. As long as the regional program demonstrates that emissions from sources within the region will collectively meet EPA's emission guideline, it can serve as the basis for individual state plans.

As long as EPA provides a mechanism that enables states to have an annual mass-based emissions budget under Section 111(d), then determining whether a regional budget trading program is equivalent to EPA's emission guideline will be a simple matter. In particular, the participating states will have to demonstrate that the annual regional emission cap under the regional program achieves emission reductions equal to or greater than those required by EPA's guidelines.

Although determining equivalency for a regional program like RGGI will generally be straightforward, EPA should develop a mechanism to address any differences in the scope of sources covered by the Section 111(d) guidelines and the scope of sources subject to the requirements of the emission budget trading program. For example, depending on the final shape of EPA's guidelines, it is possible that RGGI could include certain smaller sources that may not be covered by EPA's Section 111(d) guidelines. If the regional budget meets EPA's guidelines even with those additional sources, it clearly suffices. If the additional sources cause the regional budget to be higher than the guidelines, the participating states would demonstrate, using a rigorous and equitable methodology prescribed by EPA, that emissions from the sources covered by Section 111(d) would comply with EPA's guidelines.

Regional budget trading programs may have design elements intended to limit sharp cost escalations. For example, RGGI allows sources to use offsets for a small portion (three percent) of their compliance obligations, and the program revisions that will take effect in 2014 include a Cost Containment Reserve (CCR), which allows the distribution of a limited amount of additional allowances if prices exceed specified levels. These elements are intended to respond to unforeseen market conditions, such as greater-than-anticipated demand growth, but they may

lessen emission reductions. In their implementation plans, the participating states could either demonstrate that these design elements will not allow emissions in excess of those allowed by EPA's emission guideline, or include supplemental measures to ensure consistency with EPA's guideline.

Under a budget trading program like RGGI, enforceability, measurement, and verification are already incorporated into the program in a straightforward matter. In terms of enforceability, sources subject to a budget trading program like RGGI are required to obtain and hold a sufficient amount of allowances by the relevant compliance deadline to cover emissions over the relevant compliance period. Under the existing terms of RGGI states' respective implementing regulations, this is a regulatory requirement that is generally incorporated as a condition of each source's operating permit.

Thus, under a regional budget trading program, an emission cap is enforceable directly against individual sources in a state where the sources are located, and the failure of a source to hold sufficient allowances would violate the state's program and the source's permit. Under an approved Section 111(d) plan, this obligation of each individual source to comply with the budget trading program would become a federally enforceable condition of an individual source's Title V permit. At the end of the compliance period, the "true-up" process, in which states deduct allowances to cover sources' emissions, provides verification that the emission reductions included as part of the participating states' 111(d) plans are actually achieved.

VI.B. Portfolio of State Programs as a Compliance Pathway

As we discuss above, because Section 111(d)-covered fossil plants are embedded in larger power grids, states can reduce emissions through a wide array of programs that improve the performance of the grid as a whole, as well as addressing the plants themselves. Such "portfolio" approaches would integrate an array of programs to reduce emissions from Section 111(d) sources. Because the breadth of such approaches provides an effective platform for emission reductions, EPA should ensure that its proposed Section 111(d) guidelines can accommodate them. EPA's Roadmap for Incorporating Energy Efficiency and Renewable Energy in State Implementation Plans provides a sound foundation for that effort.

In essence, a state putting forward a portfolio plan would demonstrate to EPA that its collection of programs can collectively achieve the emissions reductions required by EPA's Section 111(d) guidelines. These programs might include, for example, energy efficiency standards that reduce demand now being satisfied by fossil plants, renewable energy standards that increase the amount of emission-free power on the grid, and dispatch rules that favor lower-carbon sources of energy over higher-carbon sources. Thus, by chipping away at demand for fossil power, introducing new supplies, and lowering the emissions from any fossil generation that is required, states would implement durable grid-level reforms to comply with Section 111(d).

Many states have programs that could help support such an approach. At least thirty states have enforceable renewable portfolio standards, and at least another seven have policy goals to increase renewable power in their states.⁷⁷ Similarly, although state energy efficiency efforts

⁷⁷ *Most states have renewable portfolio standards*, U.S. Energy Information Administration, <http://www.eia.gov/todayinenergy/detail.cfm?id=4850>.

vary widely in stringency, almost all states have implemented at least some such programs, some very aggressively.⁷⁸

Some states have taken particularly comprehensive approaches. These include California, whose AB 32 programs and related energy sector work include a 33 percent renewable portfolio standard requirement by 2020,⁷⁹ extensive energy efficiency standards, and an economy-wide cap-and-trade program, among other efforts.

We expect states to present these programs to EPA in one of two general ways, both outlined in the Roadmap:

Some states may choose to present many of their programs as federally-enforceable “control strategies” within their Section 111(d) plans.⁸⁰ Under that approach, EPA and the state would share enforcement authority over the state’s portfolio of programs, and EPA could either call for plan revisions or enforce directly against a regulated party if required emissions reductions were not forthcoming.⁸¹

We anticipate, however, that most states will prefer to instead use EPA’s “[b]aseline emissions projection pathway.”⁸² Under that pathway, states first canvass existing energy efficiency and renewable energy programs (among other programs that may affect emissions of Section 111(d) programs) and project the emissions of covered Section 111(d) sources as those programs operate over the course of the compliance period.⁸³ If the portfolio operates as intended, those projections will likely show that the portfolio programs substantially limit section Section 111(d) source emissions.

Because the portfolio of programs constraining section Section 111(d) emissions forms the background for future emissions projections, the programs themselves are not part of the state’s federally-enforceable section Section 111(d) plan, as long as other compliance obligations limit emissions.⁸⁴ For example, in California, emissions are limited by the multi-sector emissions cap, and California would demonstrate that the energy efficiency and renewable energy programs, coupled with sources’ obligation to hold allowances, limit emissions from the power sector sources to below the state’s Section 111(d) budget.

The acceptability of this demonstration turns upon the rigor of the modeling used to test various baseline assumptions. We therefore anticipate working with EPA to develop a modeling “toolkit” that would outline program evaluation methods and acceptable modeling protocols and assumptions for use in such analyses. Such evaluation tools would be used to demonstrate, at

⁷⁸ See generally *State Energy Efficiency Scorecard*, American Council for an Energy Efficient Economy (2012), <http://aceee.org/state-policy/scorecard>.

⁷⁹ See, e.g., Cal. Public Utilities Commission, *Renewable Portfolio Standard: Quarterly Report, 1st Quarter 2013* (2013), http://www.cpuc.ca.gov/NR/rdonlyres/384E3432-6EAB-4492-BF88-992874A7B978/0/2013_Q1RPSReportFINAL.pdf.

⁸⁰ EPA EE/RE Roadmap, *supra* note 49, Appendix F: Control Strategy Pathway.

⁸¹ We note, in this regard, that EPA’s Section 111(d) regulations do allow state agencies other than the state air pollution agency – such as a utility commission which may have primary responsibility over renewable portfolio requirements – to enforce portions of Section 111(d) plans. See 40 C.F.R. § 60.26(d).

⁸² See EPA EE/RE Roadmap, *supra* note 49, at 33.

⁸³ *Id.* at Appendix E: Baseline Emissions Projection Pathway (explaining this process).

⁸⁴ *Id.* at E-6.

a minimum, that, under a reasonable range of starting assumptions, Section 111(d) source emissions will fall below guideline levels by the time compliance is due, and will not then rise above those levels at any time thereafter.

While many of the grid-level programs themselves are not federally-enforceable under this approach, sources remain accountable for their emissions and could be subject to federal enforcement if necessary. In states with cap-and-trade programs, for instance, sources could be required to hold sufficient allowances to cover their emissions as a federally-enforceable program condition, just as in the RGGI example above. To show that this condition suffices to guarantee compliance, a state could demonstrate that its Section 111(d) source emissions will follow an acceptable trajectory as a result of the state portfolio of programs, and that the cap-and-trade system's allowance allocation likewise follows this trajectory under all reasonably probable trading outcomes. If that demonstration is made, requiring covered sources to hold allowances to cover their emissions would guarantee compliance because those sources would not be able to acquire sufficient allowances to exceed the aggregate emission level required by the Section 111(d) guidelines.⁸⁵

States that don't have existing cap-and-trade programs could propose such programs as a backstop obligation for covered sources. Alternatively, a similar result could be achieved by modeling how many hours covered sources may run without exceeding the guidelines (while taking reliability needs into account). Programs to reduce fossil demand will reduce the need for fossil sources, and so reduce their operating hours. States could then incorporate commensurate operating hour restrictions into the operating permits for covered sources.

We believe that this portfolio approach would apply to groups of states submitting joint plans. In that circumstance, states would undertake the modeling exercises together, thereby accounting for the total impact of all programs on sources within their boundaries.

In sum, the portfolio approach is a natural extension of the baseline modeling states routinely do when developing state implementation plans for air quality programs. Such existing programs form an important foundation for these new planning efforts and can even potentially contribute substantively to achieving required emission reductions if they are sufficiently stringent. As long as states develop clear mechanisms to hold sources to the modeled emission trajectories, and commit to regular program evaluations and necessary revisions, this portfolio approach provides an important way of recognizing state efforts to reduce emissions across the grid.

⁸⁵ If there were a serious question as to whether the portfolio (including the allowance market) would function as expected, states could also consider developing an additional, automatic, backstop mechanism which might require sources to retire additional allowances if emissions trajectories deviated sharply from what modeling had predicted.

VII. Appendix: State Experiences with Reducing Carbon Pollution

Individual descriptions of state experiences with reducing carbon pollution in the electricity sector are provided in this appendix.

VII.A. *California*

California has implemented a suite of programs to meet its goals of reducing greenhouse gas emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050.⁸⁶ These policies include groundbreaking energy efficiency programs, the most ambitious renewable energy programs in the country, and a multi-sector cap-and trade program.

California's energy efficiency standards are the bedrock upon which its climate policies are built.⁸⁷ Energy efficiency is the first resource procured under California's loading order.⁸⁸ Because California has decoupled utility profits from sales and offered utilities the opportunity to profit from efficiency, its utilities have strong incentives to pursue these savings.⁸⁹ Savings are projected at nearly 70 million megawatt hours (MWh) in 2013 alone.⁹⁰ California's efficiency efforts are an economic driver; the state produces twice as much economic output per kilowatt-hour than the national average.⁹¹ The California Energy Commission estimates that efficiency standards have generated \$74 billion in savings for Californians.⁹² According to independent analysts, California's average monthly residential energy bills are 25 percent below the national average.⁹³ Analysts have concluded that hundreds of thousands of jobs can be created by the program.⁹⁴

California strives to fill any remaining energy needs with renewable energy. California's Renewable Portfolio Standard (RPS) requires that 33 percent of electricity come from renewable sources by 2020.⁹⁵ Companies have responded with large-scale renewable projects and citizens have installed small-scale renewable energy. California has 15,000 megawatts

⁸⁶ See Cal. Air Res. Bd., Climate Change Scoping Plan 31-32, 41-46 (2008), *available at* http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

⁸⁷ See generally Cal. Energy Commission, Tracking Progress: Energy Efficiency (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/energy_efficiency.pdf.

⁸⁸ Cal. Energy Commission, Implementing California's Loading Order for Electricity Resources (2004), <http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF>.

⁸⁹ See *State Energy Efficiency Database: California*, American Council for an Energy-Efficient Economy, <http://aceee.org/sector/state-policy/california>.

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² See *Id.*

⁹³ Devra Wang, Natural Resources Defense Council, California's Energy Efficiency Success Story (2013), <http://www.nrdc.org/energy/files/ca-success-story-FS.pdf>.

⁹⁴ David Roland-Holst, Energy Efficiency, Innovation, and Job Creation in California 35 (2008), http://are.berkeley.edu/~dwrh/CERES_Web/Docs/UCB%20Energy%20Innovation%20and%20Job%20Creation%2010-20-08.pdf.

⁹⁵ See *California's Renewables Portfolio Standard (RPS)*, Cal. Public Utility Commission, <http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm>.

(MW) of installed renewable capacity, more than doubling its installed capacity since 2002.⁹⁶ In 2012, California served about 22 percent of retail energy sales with renewable energy.⁹⁷ Proponents of the RPS believe the measure could generate \$60 billion and create up to 235,000 jobs.⁹⁸ The RPS avoided 3.5 million metric tons of CO₂e in 2011 alone.⁹⁹

California is also a leader in deploying small renewable energy systems. In 2007, the state launched the California Solar Initiative, a first-of-its kind effort to deploy 3,000 MW of rooftop solar photovoltaic (PV) systems and create a self-sustaining market for the technology. It is on track to meet its goal two years early, creating thousands of local jobs and spurring technological innovation.¹⁰⁰

Importantly, California's cap-and-trade program includes power plants. By placing a price on the carbon content of electricity, the program encourages use of cleaner electricity.¹⁰¹

The state is also promoting energy storage efforts which will help further integrate renewable power into the grid,¹⁰² investing in development of other low-emission technologies,¹⁰³ implementing a GHG permitting program for new major sources of carbon pollution, and maintaining a GHG emission reporting system.¹⁰⁴

These efforts support one of the lowest-emitting electricity systems in the country. California's in-state fossil generation is almost entirely natural gas-fired,¹⁰⁵ and the state is rapidly phasing out imported power from higher-emitting coal-fired power plants. These coal imports represent only about 10 percent of California's energy portfolio, and are expected to decline by nearly two-thirds by 2020.¹⁰⁶

As a result of these efforts, California's utility sector's GHG emissions have continued to decline. Based upon the Air Resources Board's initial analysis, emissions from in-state and imported power fell by 16 million metric tons, or 16 percent, from 2005 to the 2010-12

⁹⁶ Cal. Energy Commission, Tracking Progress: Renewable Energy (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf.

⁹⁷ *Id.*

⁹⁸ Office of Senate Floor Analyses, Bill Analysis for 2011 Senate Bill 2X1 at 10 (2011), http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_cfa_20110223_155225_sen_floor.html.

⁹⁹ Cal. Environmental Protection Agency, State Agency Greenhouse Gas Reduction Report Card 10, 16 (2013), http://www.climatechange.ca.gov/climate_action_team/reports/2013_CalEPA_Report_Card.pdf. From 2008-2011.

¹⁰⁰ Cal. Solar Initiative 2013 Annual Program Assessment, Cal. Public Utilities Commission, http://www.cpuc.ca.gov/PUC/energy/Solar/2013_Annual_Program_Assessment.htm

¹⁰¹ See generally Cal. Air Resources Board, Proposed Regulation to Implement the California Cap and Trade Program, Initial Statement of Reasons (2010), <http://www.arb.ca.gov/regact/2010/capandtrade10/capisor.pdf>.

¹⁰² Electric Energy Storage, Cal. Public Utility Commission, (2013), <http://www.cpuc.ca.gov/PUC/energy/electric/storage.htm>.

¹⁰³ Electric Program Investment Charge, Cal. Energy Commission, <http://www.energy.ca.gov/research/epic/>.

¹⁰⁴ Mandatory Greenhouse Gas Reporting, Cal. Air Resources Board, (2013), <http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm>.

¹⁰⁵ Cal. Energy Commission, Tracking Progress: Installed Capacity (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/installed_capacity.pdf.

¹⁰⁶ Cal. Energy Commission, Tracking Progress: Current and Expected Energy from Coal in California (2013), http://www.energy.ca.gov/renewables/tracking_progress/documents/current_expected_energy_from_coal.pdf.

averaging period (from 108 million metric tons CO₂e to 91 million tons CO₂e).¹⁰⁷ By 2025, California expects to cut utility sector emissions to below 80 million metric tons CO₂e, a roughly 25 percent reduction from 2005 levels.¹⁰⁸ Carbon emissions from all generation are expected to decline over the 2005-2025 period, with emissions from in-state generation projected to drop by 9 million metric tons and from imported power by 20 million metric tons. California's carbon emissions rates have also fallen, from approximately 1,245 lbs CO₂e/MWh for fossil generation (considering both in-state and imported power) and 875 lbs CO₂e/MWh for all power in 2005 to an average of approximately 1,090 lbs CO₂e/MWh and 775 lbs CO₂e/MWh in the three years before 2012. Those rates are expected to decline to an estimated rate in the range of 830 lbs CO₂e/MWh for fossil sources and of about 581 lbs CO₂e/MWh for all generation by 2025.

¹⁰⁷ Cal. Air Resources Board analysis, based in part on CARB, *2008 to 2012 Emissions for Mandatory Greenhouse Gas Emissions Reporting Summary*, <http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/2008-2012-ghg-emissions-summary.pdf> (last visited Nov. 13, 2013). Analysis is preliminary, but representative. Emissions in 2012 were relatively higher than in recent years because of relatively low hydroelectric generation and the unexpected shutdown of the San Onofre Nuclear Generating Station, but the state remains on course to meet emissions targets.

¹⁰⁸ Cal. Air Resources Board analysis.

VII.B. Colorado

Colorado is on track to achieve a 29 percent reduction in carbon dioxide emissions by 2018¹⁰⁹ and has experienced significant growth in renewable power in recent years.¹¹⁰ Policies to promote energy efficiency, support renewable energy, and reduce carbon pollution play an important role in Colorado's energy outlook, including Colorado's Clean Air – Clean Jobs Act. Colorado's efforts to reduce carbon pollution will also result in reductions in other air pollutants and promote cleaner energy sources to meet electricity needs while promoting economic development.

To support greater energy efficiency—and reduce energy costs—Colorado law requires a 5 percent reduction from 2006 electricity sales by 2018 and 5 percent reduction from 2006 peak demand by 2018.¹¹¹ In 2012, the electricity demand-side management plans of the Public Service Company of Colorado and Black Hills Energy resulted in net economic benefits of \$103.7 million.¹¹² Energy efficiency goals set for Xcel Energy and Black Hills Energy under the law reduced CO₂ emissions by 1 million tons from 2009 to 2011.¹¹³

In 2010, Colorado increased its Renewable Energy Standard (RES) from 20 percent to 30 percent by 2020 for investor-owned utilities.¹¹⁴ Under legislation passed in 2013, larger rural electric co-ops must meet a 20 percent renewable target by 2020, while smaller co-ops and most municipal utilities have a 10 percent target.¹¹⁵ Caps on retail cost increases address concerns about price spikes for consumers.¹¹⁶ The RES is projected to create more than 33,000 jobs during construction and \$4.3 billion in lifetime economic output.¹¹⁷ These benefits are in addition to some 30 million tons of avoided CO₂.¹¹⁸

The Clean Air – Clean Jobs Act enacted in 2010 will significantly reduce air pollution, including GHG emissions, while improving public health, supporting in-state energy production, and spurring job creation. The law, which was supported by a diverse group of stakeholders,

¹⁰⁹ Per Colo. Department of Public Health and Environment.

¹¹⁰ EIA State Generation, *supra* note 4.

¹¹¹ Colo. Rev. Stat. § 40-3.2-104 (2013).

¹¹² Colo. Public Utility Commission, 2013 Report to the Colorado General Assembly on Demand Side Management 6 (2013), <http://cdn.colorado.gov/cs/Satellite/DORA-PUC/CBON/DORA/1251638492924>.

¹¹³ Southwest Energy Efficiency Project, House Bill 07-1037: A Success Story for Homes and Businesses in Colorado Serviced by Xcel Energy and Black Hills Energy (2011), <http://www.swenergy.org/news/news/documents/file/CO%20House%20Bill%201037%20fact%20sheet.pdf>.

¹¹⁴ Colo. House Bill 10-1001 (2010); see Colo. Governor's Energy Office, Colorado's 30% Renewable Energy Standard: Policy Design and New Markets 3 (2010), <http://cnee.colostate.edu/graphics/uploads/HB10-1001-Colorados-30-percent-Renewable-Energy-Standard.pdf>.

¹¹⁵ Colo. Senate Bill 13-252 (2013).

¹¹⁶ See Press Release, Gov. Hickenlooper Signs Executive Order, Issues Signing Statement Related to SB13-252 (June 5, 2013), <http://www.colorado.gov/cs/Satellite?c=Page&cid=1251643166067&p=1251643166067&pagename=GovHickenlooper%2FCBONLayout>.

¹¹⁷ Colo. Governor's Energy Office, Colorado's 30% Renewable Energy Standard: Policy Design and New Markets 10 (2010), <http://cnee.colostate.edu/graphics/uploads/HB10-1001-Colorados-30-percent-Renewable-Energy-Standard.pdf>.

¹¹⁸ *Id.*

including utilities, environmental groups, the natural gas industry, and state officials, requires utilities to develop plans to reduce air pollution emissions from dirtier plants.¹¹⁹ Xcel Energy, Colorado's largest utility, anticipates reducing its emissions of CO₂ in Colorado by 28 percent, NO_x by 86 percent, SO₂ by 83 percent, and mercury by 82 percent by 2020 under the law (Xcel Energy was also a participant in this dialogue).¹²⁰ Xcel's plan is predicted to have a positive economic impact of \$590 million on the state from 2010 to 2026, and to create about 1,500 jobs during peak construction.¹²¹

Colorado's electricity generation mix is made up of 10 percent renewables, 62 percent coal, and 27 percent natural gas.¹²² From 2005-2011, power generation from wind jumped 570 percent providing 4.4 million MWh—a significant increase that in part reflects the effectiveness of the state's RES.¹²³ During this time, Colorado's CO₂ emissions declined by 1.9 million tons and its CO₂ emissions rate dropped 7.9 percent while power generation increased 3.7 percent.¹²⁴

¹¹⁹ See Press Release, Gov. Ritter, Bipartisan Lawmakers & Coalition Introduce Colorado Clean Air-Clean Jobs Legislation (Mar. 16, 2010), <http://www.colorado.gov/cs/Satellite%3Fc%3DPage%26childpagename%3DGovRitter%252FGOVRLayout%26cid%3D1251573201310%26pagename%3DGOVRWrapper>.

¹²⁰ *Colorado Clean Air – Clean Jobs Act*, Xcel Energy, [http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/Colorado_Clean_Air - Clean_Jobs_Plan](http://www.xcelenergy.com/Environment/Doing_Our_Part/Clean_Air_Projects/Colorado_Clean_Air_-_Clean_Jobs_Plan).

¹²¹ *Id.*

¹²² *Generation*, Colo. Energy Office, <http://www.colorado.gov/cs/Satellite/GovEnergyOffice/CBON/1251599939003>.

¹²³ EIA State Generation, *supra* note 25.

¹²⁴ *Id.*

VII.C. Connecticut

Connecticut's early leadership to mitigate the effects of climate change produced its 2005 Climate Change Action Plan, which included increasing investments in energy efficiency, supporting the expansion of Connecticut's Renewable Portfolio Standard (RPS), and participation in the Regional Greenhouse Gas Initiatives (RGGI) among its top ten strategies for reducing the state's greenhouse gases emissions.¹²⁵ The strategies embodied in that plan set Connecticut on a firm trajectory toward meeting the emissions reductions requirements of the state's 2008 Global Warming Solutions Act: a 10 percent reduction from 1990 emissions by 2020 and an 80 percent reduction from 2001 emissions by 2050.¹²⁶

From 2005 to 2011, Connecticut expanded climate mitigation efforts to include initiatives on: clean cars, green building standards, smart growth, appliance standards and an expansion of energy efficiency to include oil heat customers.¹²⁷ As a result of these actions statewide GHG emissions decreased by nearly 5 percent from 1990 levels; bringing Connecticut almost halfway to its 2020 goal under its Global Warming Solutions Act. At the same time, Gross State Product has increased by 64 percent.¹²⁸

Between 2005 and 2011, Connecticut reduced annual emissions of carbon dioxide from its power sector by nearly 30 percent (from 11.7 to 8.2 million metric tons) and reduced the carbon intensity of its generating fleet by 30 percent (from 766 lbs/MWh to 535 lbs/MWh)¹²⁹ due to reductions in energy consumption and a shift to cleaner generation sources, catalyzed by successful state air quality regulations, including the Regional Greenhouse Gas Initiative (RGGI); improved economics and supply of natural gas as a fuel for power generation; investments in energy efficiency; and increased deployment of renewable energy sources through the RPS and other market-based tools.

Connecticut is saving energy and reducing emissions every year through investments in energy efficiency as the state pursues its statutory goal of "all cost effective energy efficiency" through its utility-administered, conservation and load management programs. Each \$1 invested in these programs provides direct energy savings for participating residents and businesses, and results in more than \$2 of system-wide benefits. Since 2006, the State's energy efficiency programs have resulted in average annual electricity savings of more than 300 million kilowatt/hrs per year,¹³⁰ which is enough electricity to power more than 30,000 homes for a year. Connecticut's efficiency programs have helped reduce electricity consumption by 10 percent

¹²⁵ Conn. Climate Change Action Plan (2005), http://www.ct.gov/deep/lib/deep/climatechange/ct_climate_change_action_plan_2005.pdf.

¹²⁶ An Act Concerning Connecticut Global Warming Solutions, Public Act No. 08-98, <http://www.cga.ct.gov/2008/ACT/PA/2008PA-00098-R00HB-05600-PA.htm>.

¹²⁷ *Climate Actions*, Conn. Department of Energy & Environmental Protection, http://www.ct.gov/deep/cwp/view.asp?a=4423&q=530720&DEEPNAV_GID=2121.

¹²⁸ Calculated based on Federal Reserve Economic Data, <http://research.stlouisfed.org/fred2>.

¹²⁹ Calculated from EIA data. EIA State Generation, *supra* note 4.

¹³⁰ Conn. Statewide Energy Efficiency Dashboard, <http://www.ctenergydashboard.com/Public/PublicHome.aspx>

from 2005 levels,¹³¹ resulting in avoiding the emission of more than 2 million tons of carbon dioxide.

Connecticut's renewable portfolio standard (RPS) requires all retail electricity suppliers to obtain at least 27 percent of their supply from renewable sources by 2020.¹³² In recent years, Connecticut has launched new initiatives that harness market forces to boost the supply of low-cost, in-state renewables. Small-scale (up to 1-2 MW) renewable distributed generation projects can compete for long-term power purchase agreements that Connecticut's electric distribution companies are required to offer through reverse auctions.¹³³ These projects support local economic development and also reduce local electricity consumption. Additionally, through various innovative financing mechanisms from the Clean Energy Finance and Investment Authority (CEFIA), Connecticut's groundbreaking "green bank," installed solar capacity within the state continues to grow.¹³⁴ CEFIA has also employed its model of leveraging state funding to attract private capital and investment in clean energy to ramp up the deployment of fuel cells throughout Connecticut. As a result of these programs, the state has increased its deployment of in-state renewables more than ten-fold since 2010, and will deploy more than 55 MW in 2013.¹³⁵ At the regional level, in 2013, Connecticut's electric companies have signed long-term power purchase agreements that will bring more grid-scale solar and wind to the regional wholesale power market, while staying on track to meet its RPS goals and displace fossil fuel generating units.

Connecticut participates in RGGI, the nation's first market-based, regulatory program to cap and reduce greenhouse gas emissions from large fossil fueled power plants. Connecticut has received more than \$87 million in proceeds from the auction of emission allowances. The state reinvests nearly 70 percent of those proceeds in energy efficiency programs that benefit individuals, businesses, and state and local governments. Connecticut also invested 23 percent of its RGGI proceeds in the deployment of more than 6 MW of clean energy systems, including residential and commercial solar photovoltaic power systems and commercial fuel cell power systems.¹³⁶ Studies indicate that each dollar of Connecticut investment of RGGI proceeds will yield more than \$394 million in net economic value to Connecticut and produce 2,036 job years of employment over 10 years.¹³⁷

Connecticut has also promoted the use of combined heat and power to achieve additional emission reductions. Through a variety of programs—including construction grants,

¹³¹ Calculated from EIA data, Retail Sales of Electricity by State by Sector by Provider, <http://www.eia.gov/electricity/data/state/>.

¹³² *Conn. Renewable Portfolio Standards Overview*, Conn. Department of Energy & Environmental Protection, Public Utilities Regulatory Authority, <http://www.ct.gov/pura/cwp/view.asp?a=3354&q=415186>.

¹³³ *Low and Zero Emissions Renewable Energy Credit Program*, Conn. Department of Energy & Environmental Protection <http://www.ct.gov/deep/cwp/view.asp?a=4120&q=503720>.

¹³⁴ Clean Energy Finance and Investment Authority, <http://www.ctcleanenergy.com/Default.aspx>.

¹³⁵ Conn. Department of Energy & Environmental Protection, *Restructuring Connecticut's Renewable Portfolio Standard ii* (2013), http://www.ct.gov/deep/lib/deep/energy/rps/rps_final.pdf.

¹³⁶ *Conn. Program Investments*, Regional Greenhouse Gas Initiative, http://www.rggi.org/rggi_benefits/program_investments/connecticut.

¹³⁷ Environment Northeast, *Economic Benefits of RGGI in CT* (June 2013), http://www.env-ne.org/public/resources/ENE_RGGI_Economic_Benefits_CT_20130627.pdf.

standardization of interconnection protocols, low interest loans, and the establishment of a CHP portfolio standard—Connecticut industry added more than 91 MW of CHP capacity, which is more than any state in the region between 2005 and 2011.¹³⁸

¹³⁸ Conn. Department of Energy and Environmental Protection, 2013 Conn. Comprehensive Energy Strategy (2013), http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf.

VII.D. Delaware

Delaware's efforts to transform its electric generation fleet have resulted in drastic reduction in CO₂ emissions. Compared to 2005, all sources of electric power generation in Delaware have lowered their CO₂ emissions by 43 percent and CO₂ emissions from coal fired units have been reduced by nearly 70 percent.¹³⁹ This is a result of a coordinated effort involving adoption of regulations that required installation of controls on coal and oil fired generating units,¹⁴⁰ participation in the Regional Greenhouse Gas Initiative, adoption of Renewable Portfolio Standards,¹⁴¹ and aggressive implementation of energy efficiency and combined heat and power.

Nine out of ten uncontrolled coal units that existed in 2005 have either retired, converted to natural gas or repowered to more efficient natural gas fired CHP. The remaining unit is equipped with activated carbon for mercury control, state of the art scrubber to reduce acid gases, and selective catalytic reduction (SCR) to control NO_x. New state-of-the-art natural gas units are replacing any lost capacity.

In addition, solar deployment has increased 25-fold, from two MW to more than 50 MW of installed capacity, and Delaware hosts some of the largest fuel cell farms in the nation. In addition, the state has invested more than \$120 million in efficiency in the past three years, including more than \$72 million in public facilities through the innovative green bonds of the Delaware Sustainable Energy Utility.¹⁴²

¹³⁹ 2005-2011. EIA State Emissions, *supra* note 4.

¹⁴⁰ Electric Generating Unit (EGU) Multi-Pollutant Regulation, 7-1100 Del. Admin. Code § 1146 (2013), *available at* <http://regulations.delaware.gov/AdminCode/title7/1000/1100/1146.shtml#TopOfPage>

¹⁴¹ *Delaware's Renewable Portfolio Standard*, Delaware Public Service Commission, <http://depssc.delaware.gov/electric/delrps.shtml>.

¹⁴² Gayathri Vaidyanathan, *Del. Creates Utility Fund for Public Building Retrofits*, Greenwire (Oct. 20, 2011), *available at* http://www.seu-de.org/Press/2011_media_E&E_News_Greenwire_SEU_Bond_Story_10Oct%2020.pdf.

VII.E. Illinois

Illinois encourages efforts to reduce carbon pollution and increase clean energy through its energy efficiency and renewable energy standards. In addition, the state plays a leading role in advancing carbon capture and storage (CCS) technologies through the FutureGen project in conjunction with the U.S. Department of Energy.¹⁴³

Energy efficiency policies require electric utilities to save two percent of electricity annually by 2015 and have reduced rate-payer spending on electricity.¹⁴⁴ For example, in the first year (2008-2009) of the Illinois Public Utilities Act, Ameren Illinois Utilities (AIU) customers saved almost 90,000 MWh, far exceeding AIU's goal for that year.¹⁴⁵ In Plan Year 3 (June 2010-May 2011), another major utility, Commonwealth Edison Company (ComEd), achieved about 662,000 MWh net energy savings through its energy-efficiency and demand-response programs.¹⁴⁶

Under its RPS, Illinois requires that 25 percent of its electricity come from renewables by 2025.¹⁴⁷ The state has experienced significant growth in wind power development as a result—electricity generation from wind increased by more than six million MWh from 2005-2011.¹⁴⁸ Growth in wind energy from 2003 to 2010 alone created almost 10,000 new local jobs during construction and a lifetime economic benefit of \$3.2 billion, according to one analysis.¹⁴⁹ In 2011, Illinois avoided about five million tons of CO₂ emissions from renewable resource integration, along with four million tons of NO_x.¹⁵⁰

In addition to its CCS work on FutureGen, Illinois aims to significantly reduce carbon pollution from any new coal plants through emission standards. From 2009-2015, any new coal-fueled power plant must capture and store 50 percent of the carbon emissions that the facility would otherwise emit.¹⁵¹ This target increases to 70 percent from 2016-2017 and to 90

¹⁴³ See FutureGen Alliance, <http://www.futuregenalliance.org/>.

¹⁴⁴ 220 Ill. Comp. Stat. 5/8-103(b) (2013).

¹⁴⁵ See Ameren Ill. Utilities, ActOnEnergy Energy Efficiency and Demand-Response Program Results 9 (2010), available at http://library.cee1.org/sites/default/files/library/8579/CEE_Eval_AIUEnergyEfficiencyPofolioReport2008_2009_11an2010.pdf.

¹⁴⁶ Navigant Consulting, Inc., Evaluation Report: Summary Report Final 1 (2012), available at http://ilsagfiles.org/SAG_files/Evaluation_Documents/ComEd/ComEd%20EPY3%20Evaluation%20Reports/ComEd_Summary_PY3_Evaluation_Report_Final.pdf.

¹⁴⁷ Ill. Pub. Act 095-0481 (2007).

¹⁴⁸ EIA State Generation, *supra* note 4.

¹⁴⁹ Ctr. for Renewable Energy, Illinois State University, Economic Impact: Wind Energy Development in Illinois 6, 25 (2010), http://web.extension.illinois.edu/lgien/pdf/events/2012_04-19_economic.pdf.

¹⁵⁰ Ill. Power Agency, Annual Report: The Costs and Benefits of Renewable Resource Procurement in Illinois Under the Illinois Power Agency and Illinois Public Utilities Acts 35 (2013), <http://www2.illinois.gov/ipa/Documents/201304-IPA-Renewables-Report.pdf>.

¹⁵¹ Ill. Clean Coal Portfolio Standard, Public Act 095-1027 (2009).

percent after 2017.¹⁵² These policies are especially notable as coal provides 45 percent of the state's electricity.¹⁵³

¹⁵² *Id.*

¹⁵³ 2011 data. EIA State Generation, *supra* note 4.

VII.F. Maryland

Maryland has achieved significant electricity sector GHG emission reductions since 2006—a decline of 9.7 million metric tons, or 30 percent—due in significant part to its participation in the Regional Greenhouse Gas Initiative (RGGI), a requirement to reduce energy use, its RPS, and regional fuel switching.¹⁵⁴

In July 2013, a plan released by Governor Martin O'Malley outlined more aggressive measures the state can take to meet its economy-wide goal to reduce GHG pollution 25 percent from 2006 levels by 2020.¹⁵⁵ Continuing to reduce carbon pollution from the electricity sector through participation in RGGI, energy efficiency programs, and renewable energy programs are key components of the plan. An independent study found the overall collection of climate and energy proposals would generate \$1.6 billion for Maryland's economy and support 37,000 jobs.¹⁵⁶

Through recently announced programmatic changes to RGGI, including a reduction in the regional emissions cap of more than 50 percent from 2005 levels by 2020, Maryland expects to further reduce the state's 2020 CO₂ emissions from the electricity sector by an additional 3.6 million metric tons.¹⁵⁷

The state's EmPOWER Maryland initiative mandates a 15 percent reduction in peak demand and per-capita electricity consumption and demand by 2015 from 2007 levels. Ten percent of the overall reduction must come from measures implemented by the state's utilities and five percent from other energy efficiency programs.¹⁵⁸ To date, Maryland has achieved a 10.8 percent reduction in peak electricity demand, equivalent to avoiding one coal power plant.¹⁵⁹ The state is on track to exceed its peak demand target with a current projected 17.7 percent reduction in peak demand by 2015. The EmPOWER Maryland program has funded measures that will reduce ratepayer electricity use by more than 2 million MWh per year and save \$250 million annually.¹⁶⁰ These savings will continue for years, with currently existing measures saving ratepayers \$3.7 billion over their useful life.¹⁶¹ Total annual GHG emission reductions attributable to aggressive implementation of EmPOWER Maryland could reach 10.52 million metric tons of CO₂e in 2020.¹⁶²

¹⁵⁴ Reduction based on emissions from in-state electricity generation. Per Md. Department of the Environment.

¹⁵⁵ Md. Department of the Environment, Maryland's Greenhouse Gas Reduction Plan (2013) http://www.climatechangemaryland.org/site/assets/files/1184/mde_ggrp_execsummary_2013.pdf [hereinafter Md. 2013 GHG Reduction Plan]. Maryland's Greenhouse Gas Reduction Act requires Maryland to achieve a 25 percent reduction in state-wide greenhouse gases from 2006 levels by 2020 and establishes a long-term goal to reduce emissions 90 percent by 2050. Md. Code Ann., Envir. §§ 2-1201 to 1211.

¹⁵⁶ Md. 2013 GHG Reduction Plan, *supra* note 155, at 192-93.

¹⁵⁷ Press Release, Md. Energy Administration, RGGI States Propose Lowering Regional CO₂ Emissions Cap 40%, <http://www.mde.state.md.us/programs/PressRoom/Pages/0207RGGIAnnouncement.aspx>.

¹⁵⁸ Per Md. Energy Administration.

¹⁵⁹ *Id.* Similarly, since 2007, the state's per capita energy consumption has declined by nearly 10 percent.

¹⁶⁰ *EmPOWER Maryland Planning*, Md. Energy Administration, <http://energy.maryland.gov/empower3/>.

¹⁶¹ *Id.*

¹⁶² Md. 2013 GHG Reduction Plan, *supra* note 155, at 84.

Maryland's RPS requires 20 percent of electricity consumed in the state to be generated by renewable energy sources in 2022. A proposal to increase the RPS to 25 percent by 2020 is under consideration.¹⁶³ Maryland's RPS includes a solar "carve out" requiring 2 percent of all electricity delivered in Maryland to come from in-state solar generation (photovoltaic or thermal) by 2020.¹⁶⁴ The Maryland Offshore Wind Energy Act of 2013 establishes revenue certainty for 20 years for a 200 MW offshore wind project, and is a key component of the state's renewable energy expansion.¹⁶⁵

Coal is the single largest source of electricity in Maryland's generation portfolio. However, during the period from 2005 to 2012, the percentage of electricity generated from coal dropped from 56 to 43 percent. Maryland's CO₂ emission rate per MWh hour declined by 12 percent during 2005-2011.¹⁶⁶ The state's Calvert Cliffs nuclear plant provides 35 percent of the state's electricity, and renewables, including hydroelectric plants, wind farms, and solar cells now contribute nearly seven percent.¹⁶⁷

¹⁶³ *Id.* at 84-85; Md. Code Ann., Pub. Util. Cos. § 7-701 et seq.

¹⁶⁴ Md. Code Ann., Pub. Util. Cos. § 7-701.

¹⁶⁵ Per Md. Energy Administration June 27 presentation or comments; *see also* Md. Offshore Wind Energy Act of 2013, House Bill 226 (2013).

¹⁶⁶ Emission rate calculated using all electricity generation. EIA State Generation, *supra* note 4; EIA State Emissions, *supra* note 4.

¹⁶⁷ 2011 data. U.S. Energy Information Administration, Maryland State Profile, <http://www.eia.gov/state/?sid=MD#tabs-4>.

VII.G. Massachusetts

The Global Warming Solutions Act (GWSA), signed by Governor Patrick in August of 2008, created a framework for reducing heat-trapping emissions to levels that scientists believe give us a decent chance of avoiding the worst effects of global warming. It requires reductions from all sectors of the economy to reach a 25 percent reduction of greenhouse gas emissions (GHGs) below 1990 levels by 2020 and an 80 percent reduction by 2050, the path toward which is laid out in the Massachusetts Clean Energy and Climate Plan for 2020.¹⁶⁸

- Massachusetts is showing the way to a clean energy economy—and it is reaping some of the direct benefits in economic growth—through the development of smart, targeted policies that reduce emissions by promoting greater energy efficiency, developing renewable energy, and encouraging other alternatives to the combustion of fossil fuels. Elements of this success include:
- From 1990 to 2011, the New England electric grid operator indicates total Massachusetts electric consumption increased by 22 percent; however, associated emissions dropped 37 percent because higher carbon fuels like coal and oil are being replaced with cleaner fuels like natural gas and renewable sources. This shift can be attributed to successes of the renewable energy requirements, the regional CO₂ cap-and-trade system, air quality regulations and the recent natural gas boom in the United States. In recent years the growth rate in electric demand has flattened due in large part to investment in end-use energy efficiency.¹⁶⁹
- Massachusetts is one of the states participating in the Regional Greenhouse Gas Initiative (RGGI), the nation's first market-based regulatory program to cap and reduce greenhouse gas emissions from large fossil-fueled power plants. Massachusetts has directed the vast majority of its RGGI proceeds into clean energy programs and initiatives. Since 2008, Massachusetts has received more than \$233 million in RGGI auction proceeds, which it has used to implement energy programs that improve building efficiency, comfort, durability, health, and affordability for individuals, businesses, and state and local governments.
- Massachusetts is saving energy every year through with new energy efficiency investments and programs as the state continues to embrace efficiency as its “First Fuel.” These diverse programs have saved enough electricity to power almost 110,000 homes for a year and enough natural gas to heat 15,000 homes for a year. Energy

¹⁶⁸ Massachusetts Clean Energy and Climate Plan for 2020 (2010), <http://www.mass.gov/eea/docs/eea/energy/2020-clean-energy-plan.pdf>. For more information, see the Global Warming Solutions Act Dashboard: <http://www.mass.gov/eea/air-water-climate-change/climate-change/massachusetts-global-warming-solutions-act/global-warming-solutions-act-dashboard.html>. Except for where otherwise noted, all data in this document is drawn from the Dashboard, updated by MassDEP October 2013.

¹⁶⁹ *Regional Greenhouse Gas Initiative Auction Proceeds*, Massachusetts Executive Office of Energy and Environmental Affairs, <http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/doer/rggi-auction-proceeds.html>.

efficiency has reduced greenhouse gas emissions by more than 431,000 metric tons—the equivalent of taking about 85,000 cars off Massachusetts' roads for a whole year. For every one dollar invested in efficiency, the average benefit was \$4.17 for homeowners and \$5.10 for businesses. Massachusetts' bold energy efficiency initiatives have made it the most energy efficient state in the country for the last three years, according to the American Council on an Energy Efficient Economy.¹⁷⁰

- Massachusetts is dramatically boosting renewable energy generation. Due to financial incentives such as renewable energy credits, net metering, and long-term contracts, solar energy capacity has grown from 1.64 MW in 2007 to 327 MW in 2013, reaching Governor Patrick's goal of 250 MW 4 years early;¹⁷¹ wind energy has grown from 1.64 MW to 103 MW in these same years.¹⁷² And Massachusetts is vigorously pursuing other clean energy solutions, such as combined heat and power, and energy from the anaerobic digestion of food waste.
- Green building standards have created new markets for energy efficient building design, retrofit, and operations. Almost 200 new LEED-certified buildings were constructed in Massachusetts from 2001-2011.
- The Commonwealth's clean energy industry is growing rapidly, despite a tough economic environment nationally. Surveys by the Clean Energy Center show that there was an increase in clean energy jobs of 11.8 percent in 2013 and now almost 80,000 employees are working in clean energy throughout the Commonwealth. Since 2011, this growth has outpaced the growth in the Massachusetts economy by more than eight times. Clean energy continues to maintain its place as one of the Commonwealth's marquee industries with 1.9 percent of the total Massachusetts work force.

Thanks to a combination of these measures, since 1990 statewide GHG emissions have fallen 10%, while over the same period Gross State Product has increased 68 percent. These results clearly disprove the myth that environmental protection hinders economic progress. In the past decades—against a backdrop of tightening federal and state emission limits on many sectors, from factories and power plants to automobiles—Massachusetts' population and total energy use have grown modestly as the state's economy has increased dramatically. Over the same period, emissions of greenhouse gases and other air pollutants have dropped. Massachusetts looks forward to continuing this trend of emissions reductions coupled with economic growth as it works toward the limits set by the Global Warming Solutions Act and federal stationary source GHG regulations.

¹⁷⁰ ACEEE, The State Energy Efficiency Scorecard, <http://aceee.org/state-policy/scorecard>.

¹⁷¹ Mass. Department of Energy Resources, Installed Solar Capacity (2013), <http://www.mass.gov/eea/docs/doer/renewables/installed-solar.pdf>.

¹⁷² Mass. Department of Energy Resources, Installed Wind Capacity (2013), <http://www.mass.gov/eea/docs/doer/renewables/installed-wind.pdf>.

VII.H. Minnesota

From 2005-2011, Minnesota experienced a 17.5 percent reduction in carbon dioxide pollution.¹⁷³ Policies to reduce carbon dioxide emissions, reduce emissions of mercury and other air pollutants, increase renewable energy use, and improve energy efficiency have helped drive these reductions. To build on this progress, the state has established goals to reduce greenhouse gas emissions by 15 percent from 2005 levels by 2015, by 30 percent by 2025, and by 80 percent by 2050.¹⁷⁴

Minnesota has a target of reducing energy use by 1.5 percent per year through energy efficiency measures.¹⁷⁵ Minnesota's Conservation Improvement Program (CIP) requires utilities to spend a minimum of 1.5 percent of annual operating revenues on incentives like rebates on high-efficiency appliances and efficient lighting programs.¹⁷⁶ CO₂ emissions reductions from the CIP have been increasing in recent years, reaching more than 800,000 tons in 2010.¹⁷⁷

Minnesota's Renewable Energy Standard (RES) requires utilities to generate 25 percent of their power from renewables by 2025.¹⁷⁸ Xcel Energy, the state's largest utility, must achieve 30 percent from renewables by 2020, one quarter of which must be met with wind. All utilities have met their 2012 RES goals and most ratepayers are experiencing cost benefits.¹⁷⁹ New legislation creates an additional solar energy standard that will require investor-owned utilities to obtain 1.5 percent of their power from solar energy by 2020.¹⁸⁰ Between 2000 and 2010, wind power generation in Minnesota increased 900 percent and natural gas generation increased 250 percent.¹⁸¹ Most of the growth in natural gas use occurred after its price dropped from historic highs in 2008.¹⁸² Also between 2000 and 2010, the use of biomass for power generation increased 60 percent, while the use of coal for power generation decreased about 17 percent and use of petroleum for power generation decreased 94 percent.¹⁸³ The chart below shows the current electricity generating mix in Minnesota today.¹⁸⁴

¹⁷³ Reduction in in-state electricity generation. EIA State Emissions, *supra* note 4.

¹⁷⁴ Minn. Stat. § 216H.02.

¹⁷⁵ Minn. Stat. § 216B.2401. Amended 2013 to "at least" 1.5%.

¹⁷⁶ *How CIP Works*, Minn. Department of Commerce, <http://mn.gov/commerce/energy/topics/conservation/How-CIP-Works.jsp>; Minn. Stat. 216B.241.

¹⁷⁷ Minn. Department of Commerce, Minnesota Conservation Improvement Program Energy and Carbon Dioxide Savings Report for 2009-2010 at 3 (2012), <http://mn.gov/commerce/energy/images/CIPCO2Rpt2012.pdf>.

¹⁷⁸ *Renewable Energy*, Minn., <http://mn.gov/portal/natural-resources/renewable-energy/>; Minn. Stat. § 216B.1691.

¹⁷⁹ Minn. Department of Commerce, Progress on Compliance by Electric Utilities with the Minnesota Renewable Energy Objective and the Renewable Energy Standard 3, 9 (2013), <http://mn.gov/commerce/energy/images/2013RESLegReport.pdf>.

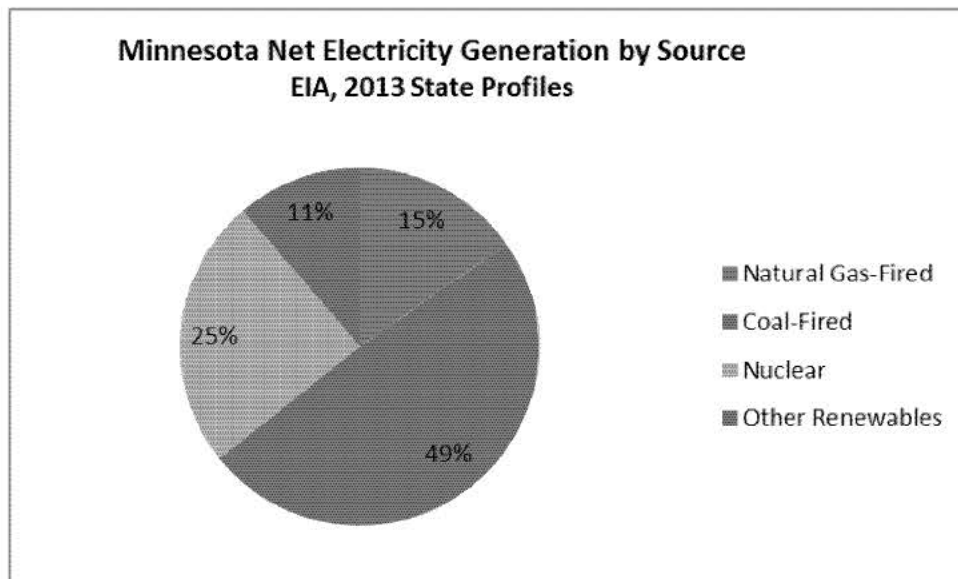
¹⁸⁰ *Governor OKs Solar Energy Bill*, Greenwire (May 24, 2013); Minn. Stat. § 216B.1691 (Subd. 2f.).

¹⁸¹ Provided by Minn. Department of Commerce.

¹⁸² *Id.*

¹⁸³ *Id.*

¹⁸⁴ *Id.*



Under the 2007 Next Generation Energy Act, Minnesota prohibits new coal-fired power plants that produce a net increase in carbon emissions.¹⁸⁵ Utilities cannot import electricity from large fossil fuel-fired power plants in another state that were not operating by January 1, 2007.¹⁸⁶ Minnesota also has a longstanding moratorium on new nuclear power plants, although two existing plants operate.¹⁸⁷

From 2005-2011, Minnesota reduced its CO₂ emissions by 6.9 million tons, lowering its CO₂ emissions rate by 17.5 percent, even while power generation slightly increased.¹⁸⁸ Minnesota experienced economic growth as emissions have dropped and electricity rates remain competitive.¹⁸⁹ Minnesota is committed to continuing its transformation of the nature of the generation of electric power used in Minnesota and look to this federal rulemaking to help meet our commitments.

¹⁸⁵ Minn. Stat. § 216H.03.

¹⁸⁶ *Id.*

¹⁸⁷ Per Minn. Department of Pollution Control Agency.

¹⁸⁸ In-state electricity generation. EIA State Emissions, *supra* note 4.

¹⁸⁹ Per Ellen Anderson, Energy Adviser to Minnesota Gov. Mark Dayton.

VII.I. New Hampshire

New Hampshire demonstrated early leadership to mitigate the effects of climate change by enacting its Clean Power Act in 2002. It also produced its revised March 2009 Climate Change Action Plan, which included recommendations for maximizing energy efficiency, increasing renewable energy required by its Renewable Portfolio Standard (RPS), and participation in the Regional Greenhouse Gas Initiatives (RGGI) among its top strategies for reducing the state's greenhouse gases emissions.¹⁹⁰ The strategies embodied in that plan set New Hampshire on a firm trajectory toward meeting the emissions reductions goals: a 20 percent reduction from 1990 emissions by 2025 and an 80 percent reduction by 2050.

New Hampshire has achieved a 38 percent reduction in carbon pollution from the power sector in the past seven years due to policies that have capped carbon emissions, required more renewable energy generation, invested in energy efficiency, and experienced fuel-switching from coal to natural gas.¹⁹¹ New Hampshire's policies have resulted in significant new clean generation sources, including increased operation of new, efficient natural gas plants, increased operation of a nuclear plant, and increased renewable power generation. New Hampshire's participation in RGGI is a major factor in the state's efforts to curb carbon pollution while generating more than \$57 million in proceeds from the auction of emission allowances.¹⁹²

New Hampshire is one of nine states that form RGGI, the first emissions budget and allowance trading program in the United States to reduce GHG emissions from the power sector. A study by The Analysis Group found the first three years of RGGI produced \$1.6 billion in economic growth while lowering consumer energy bills.¹⁹³ New Hampshire uses a portion of the proceeds from RGGI allowance auctions to invest in energy efficiency in communities and support green jobs. As of June 2012, New Hampshire's cumulative energy savings due to projects that received RGGI funds (\$21.8 million spent) are expected to be \$107.8 million through 2030 based on current energy prices. For every dollar spent as of June 2012, the expected return is \$4.95 in energy savings.¹⁹⁴

¹⁹⁰ NH Climate Change Action Plan (2009), http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/nh_climate_action_plan.htm.

¹⁹¹ 2005-2011. EIA State Emissions, *supra* note 4.

¹⁹² 2013 RGGI Annual Report to Legislative Committees (2013), <http://puc.nh.gov/Sustainable%20Energy/GHGERF/RGGI%20Annual%20Reports/2013%20RGGI%20Annual%20Report%20to%20NH%20Legislature.pdf>.

¹⁹³ Analysis Group, The Regional Greenhouse Gas Initiative: Economic Impacts of the First Three Years (2011), http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Fact_Sheet.pdf.

¹⁹⁴ Carbon Solutions New England, New Hampshire Greenhouse Gas Emissions Reduction Fund (GHGERF): Year 3 (July 2011 – June 2012) Evaluation (2012), http://puc.nh.gov/Sustainable%20Energy/GHGERF/Evaluations/GHGERF_Year%203_annual_report_2011-12_FINAL.pdf

(Greenhouse Gas Emissions Reduction Fund administered by the NH Public Utilities Commission (PUC)).

New Hampshire's RPS calls for 24.8 percent of the state's electricity to come from renewable sources by 2025.¹⁹⁵ This policy boosted the use of biomass and hydroelectric resources and jumpstarted wind power development. The New Hampshire Public Utilities Commission (PUC) administers the Renewable Energy Fund, (REF) under which it has established five grant and rebate programs that have seen substantial demand and growth since their creation following the REF's establishment in 2009. The REF has awarded 1,614 rebates for renewable energy systems, and provided New Hampshire homeowners, businesses, schools, towns, non-profit organizations and other eligible entities with \$7,455,536 in funding toward these systems. In addition, the PUC's competitive grant program has provided close to \$2 million in funding for renewable projects featuring technologies from biomass heating systems to hydroelectricity upgrades to photovoltaic, solar hot air, and landfill-gas-to-energy, among others. In 2013, it is expected that an additional \$4 million will be awarded through additional grants for renewable energy projects. These rebate and grant funds have leveraged \$38.4 million in private investment, providing a boost to the state's economy and creating jobs for electricians, plumbers, and alternative energy businesses.¹⁹⁶

These new policies and the low price of natural gas have delivered a cleaner power sector in New Hampshire and resulted in lower wholesale electricity prices. Fourteen percent of New Hampshire's 2011 net electricity generation came from renewable energy.¹⁹⁷ Natural gas accounted for 33 percent of New Hampshire's net electricity generation in 2011, up from 24 percent in 2010.¹⁹⁸ The Seabrook nuclear power reactor, the largest in New England, provided 42 percent of New Hampshire's 2011 net electricity generation.¹⁹⁹

¹⁹⁵ *Electric Renewable Portfolio Standard*, New Hampshire Public Utilities Commission, http://puc.nh.gov/Sustainable%20Energy/Renewable_Portfolio_Standard_Program.htm

¹⁹⁶ New Hampshire Public Utilities Commission, 2013 REF Annual Report to Legislative Committees (2013), <http://puc.nh.gov/Sustainable%20Energy/Renewable%20Energy%20Fund/2013%20REF%20Report%20to%20Legislature%2010-1-13.pdf>.

¹⁹⁷ 2011 data. U.S. Energy Information Administration, New Hampshire State Profile, <http://www.eia.gov/state/?sid=NH>.

¹⁹⁸ *Id.*

¹⁹⁹ *Id.*

VII.J. New York

New York has achieved a 39 percent reduction in carbon pollution from the power sector in the past seven years due to policies that have capped carbon emissions, required more renewable energy generation, and invested in energy efficiency, as well as a switch in generation sources from coal to natural gas due in part to low natural gas prices.²⁰⁰ New York's policies have resulted in significant additions of clean generation sources, including new efficient natural gas plants and renewables. New York's participation in RGGI is a major factor in the state's efforts to curb carbon pollution while generating nearly \$600 million to date for a broad spectrum of clean energy programs.²⁰¹

New York is one of nine states that form RGGI, the first emissions budget and allowance trading program in the United States to reduce GHG emissions from the power sector. An independent study by the Analysis Group found the first three years of RGGI produced \$1.6 billion in economic growth while lowering consumer energy bills.²⁰² New York uses proceeds from RGGI allowance auctions, which are projected at approximately \$65 million annually, to invest in comprehensive strategies that help achieve the RGGI CO₂ emission reduction goals to reduce GHG pollution through energy efficiency, renewable energy, and carbon abatement technology.²⁰³ RGGI revenues support green jobs, including the training of 1,000 workers to implement building retrofits.²⁰⁴ The revenues also fund solar power installation efforts.²⁰⁵ Overall, RGGI-funded projects have benefited more than 55,000 households and 600 businesses in New York.²⁰⁶

New York implemented an energy efficiency goal reducing energy consumption 15 percent by 2015.²⁰⁷ As a result of this Energy Efficiency Portfolio Standard, the 2009 New York State Energy Plan projected emissions reductions of more than 9 million tons of CO₂ in 2015, as well as 6,544 tons of NO_x and 9,040 tons of SO₂.²⁰⁸ While more savings are achievable, third party

²⁰⁰ 2005-2011. EIA State Emissions, *supra* note 4.

²⁰¹ \$583.4 million in cumulative proceeds from auction of New York allowances, as of Dec. 6, 2013. *Cumulative Allowances and Proceeds by State*, Regional Greenhouse Gas Initiative, http://www.rggi.org/market/co2_auctions/results#state_proceeds.

²⁰² Analysis Group, *The Regional Greenhouse Gas Initiative: Economic Impacts of the First Three Years* (2011) http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Fact_Sheet.pdf.

²⁰³ N.Y. State Department of Environmental Conservation. *See also* N.Y. State Energy Research & Development Authority, *Regional Greenhouse Gas Initiative Investment Plan* (2013), <http://www.nyserda.ny.gov/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx>.

²⁰⁴ N.Y. State Department of Environmental Conservation.

²⁰⁵ *Id.*

²⁰⁶ *Id.*; *Regional Greenhouse Gas Initiative*, N.Y. State Department of Environmental Conservation, <http://www.dec.ny.gov/energy/rggi.html#Rulemaking>.

²⁰⁷ N.Y. State Public Service Commission, *Order Establishing Energy Efficiency Portfolio Standard and Approving Programs*, Case 07-M-0548 (June 18, 2008), *available at* <http://www3.dps.ny.gov/W/PSCWeb.nsf/0/06F2FEE55575BD8A852576E4006F9AF7?OpenDocument>.

²⁰⁸ State Energy Planning Bd., *Energy Efficiency Assessment*, New York State Energy Plan 2009 at 29 (2009), <http://www.nysenergyplan.com/Prior-State-Energy-Plans/2009stateenergyplan.aspx>.

analysis shows by the end of 2011 the program had avoided \$3.2 billion in wasted energy costs and created about 10,000 jobs.²⁰⁹

New York's RPS calls for 30 percent of the state's electricity to come from renewable sources by 2015.²¹⁰ This policy has boosted wind power development and jumpstarted solar resource development in the Empire State. The New York State Energy Research and Development Authority (NYSERDA) estimates that the RPS avoided 4.1 million tons of CO₂ from 2006 to 2012, along with 4,028 tons of NO_x and 8,853 tons of SO₂.²¹¹ NYSERDA expects that projects initiated to meet the standard will inject \$1.1 billion into the state's economy over their operating lives.²¹²

These new policies and the low price of natural gas have delivered a cleaner power sector in New York and resulted in lower wholesale electricity prices.²¹³ New York currently gets 22 percent of its energy from renewable sources, 18 percent of which comes from hydroelectric power.²¹⁴ Prior to implementing an RPS, New York generated only a nominal amount of wind power.²¹⁵ It now has more than 1,600 MW of installed wind energy capacity, accounting for two percent of the state's power.²¹⁶ Natural gas power plants generate 44 percent of New York's electricity.²¹⁷ Nuclear power plants produce 30 percent of the generation mix.²¹⁸ From 2005-2011, New York reduced 24 million tons of CO₂ emissions from the power sector and its CO₂ emission rate declined 35 percent.²¹⁹

²⁰⁹ Pace Energy & Climate Center, Energy Efficiency in New York: Midcourse Status Report of '15 by 15' at 6 (2012), http://energy.pace.edu/sites/default/files/publications/Energy%20Efficiency%20in%20New%20York%2015x15_0.pdf.

²¹⁰ Per N.Y. State Department of Environmental Conservation June 27 presentation, comments; N.Y. State Public Service Commission, Order Establishing New RPS Goal and Resolving Main Tier Issues, Case 03-E-0188 (Jan. 8, 2010), *available at*

<http://www3.dps.ny.gov/W/PSCWeb.nsf/0/1008ED2F934294AE85257687006F38BD?OpenDocument>.

²¹¹ N.Y. State Energy Research & Development Authority, The New York State Renewable Portfolio Standard Performance Report 19 (2012), <http://www.nyserdera.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/Renewable-Portfolio-Standard-Reports.aspx>.

²¹² *Id.*

²¹³ Per N.Y. State Department of Environmental Conservation.

²¹⁴ 2012 data. EIA State Generation, *supra* note 4.

²¹⁵ N.Y. State Energy Research & Development Authority, RPS Performance Report (2013), <http://www.nyserdera.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Program-Planning/Renewable-Portfolio-Standard/Main-Tier/Documents.aspx>.

²¹⁶ 2011 data, U.S. Energy Information Administration, Existing Nameplate and Net Summer Capacity by Energy Source, Producer Type and State (EIA-860), http://www.eia.gov/electricity/data/state/existcapacity_annual.xls.

²¹⁷ 2012 data. EIA State Generation, *supra* note 4.

²¹⁸ *Id.*

²¹⁹ *Id.*; EIA State Electric Power Emissions, *supra* note 4.

VII.K. Oregon

In 2007, Oregon established ambitious goals for reducing statewide emissions to 75 percent below 1990 levels by 2050.²²⁰ While significant progress is required to meet this goal, the state recently announced that the first interim goal—arresting growth and beginning to reduce emissions by 2010—has been met.²²¹ A significant part of this progress has been achieved through a variety of programs that have improved energy efficiency across the state and increased investment in renewable energy. Following are brief descriptions of several programs Oregon has implemented that have reduced emissions from the power sector.

- The Energy Facility Siting Council Carbon Dioxide Standard sets carbon dioxide emissions standards for new energy facilities (currently 0.675 lbs/KWh for baseload gas plants). An applicant has three alternatives for meeting the standard: 1) on-site cogeneration, 2) implementing offset projects directly or through a third party; or, 3) to pay the Climate Trust \$1.27 per ton to offset emissions for the applicant.²²²
- The Emissions Performance Standard requires that all long-term commitments for power meet an emissions standard of 1,100 lbs/MWh, regardless of the geographic location of the generation.²²³
- The Renewable Portfolio Standard requires that all utilities serving Oregon load must include in their portfolio a percentage of electricity generated from qualifying renewable energy sources. The percentage of qualifying electricity that must be included varies by utility, with Oregon's three largest utilities required to reach 5 percent in 2011, 15 percent in 2015, 20 percent in 2020, and 25 percent in 2025.²²⁴
- The Oregon PUC's integrated resource planning approach requires electric utilities to update 20-year plans every two years that identify the resources to meet expected demand that provide the best mix of cost and risk. Costs of potential future greenhouse gas regulation are required to be explicitly evaluated for major capital investments and environmental compliance investments in existing resources.
- Oregon's public purpose charge takes 3 percent of the total revenues collected by the utilities to provide roughly \$60 million per year to support energy efficiency, renewable energy, and low-income programs in Oregon. Furthermore, utilities are required to assess the achievable cost effective conservation potential in their service territories. If there is a gap between the potential and what can be achieved through funding provided by the public purpose charge funding, the utilities can ask for rate recovery in order to

²²⁰ Global Warming Actions, 2007 Or. Laws 907,
http://www.oregonlegislature.gov/bills_laws/lawsstatutes/2007orLaw0907.html.

²²¹ Or. Global Warming Commission Report to Legislature (2013),
http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/OGWC_2013_Rpt_Leg.pdf

²²² Or. Department of Energy, Oregon's Carbon Dioxide Standards For New Energy Facilities (2010),
<http://www.oregon.gov/energy/Siting/docs/Reports/CO2Standard.pdf>.

²²³ Or. Department of Energy, Greenhouse Gas Emissions Standard,
http://www.oregon.gov/energy/GBLWRM/docs/GHG_Rules.pdf.

²²⁴ *Renewable Portfolio Standard*, Or. Department of Energy,
<http://www.oregon.gov/energy/RENEW/RPS/Pages/index.aspx>.

pursue the additional conservation. Recently, this has provided approximately \$125 million per year for cost-effective energy efficiency.²²⁵

- Oregon's Residential Energy Tax Credit program has provided a wide variety of tax credits for efficient appliances, cars and energy systems.²²⁶ Similarly, tax credits aimed at business and commercial customers provided a wide range of credits for energy efficiency and renewable energy. Currently this program provides credits for high efficiency heating and air conditioning systems, as well as energy generation and alternative fuel systems.

Overall, Oregon has made considerable reductions in greenhouse gas emissions associated with the generation of electricity supplied in the state. Between 2005 and 2010, emissions associated with electricity used by Oregon households and businesses declined 10 percent.²²⁷ This reduction—spurred by the policies described above—has helped the state meet its first greenhouse gas reduction goal; meeting the ambitious goals for the future will require the state to build on these policies and the introduction of new approaches.

²²⁵ *Public Purpose Charges for PGE*, PacifiCorp, Or. Department of Energy, <http://www.oregon.gov/energy/cons/pages/sb1149/business/ppcinvest.aspx>.

²²⁶ *About Oregon's Residential Energy Tax Credit Program*, Or. Department of Energy, http://www.oregon.gov/ENERGY/RESIDENTIAL/Pages/residential_energy_tax_credits.aspx.

²²⁷ Or. Department of Environmental Quality, *Oregon's Greenhouse Gas Emissions Through 2010: In-Boundary, Consumption-Based and Expanded Transportation Sector Inventories (2013)*, <http://www.oregon.gov/DEQ/AQ/Pages/Greenhouse-Gas-Inventory-Report.aspx>.

VII.L. Washington

Washington produces very low carbon emissions from its electricity sector due to its expansive hydroelectric resources. The state is taking steps to further reduce its carbon emissions through energy conservation and renewable energy programs, as well as by requiring the early closure of its only coal plant. Washington achieved a 46 percent carbon emissions reduction from 2005 to 2011, and reduced its carbon emissions rate by 52 percent over the same period, from 328 to 158 lbs CO₂/MWh of electricity generated.²²⁸

Washington has achieved significant savings from its energy conservation programs. In 2012, the State of Washington achieved 980,643 MWh of incremental conservation savings, out of retail sales of 92,675,126 MWh.

Washington voters approved ballot initiative 937 in November 2006 which set new renewable energy resource and conservation requirements for electric utilities to meet.²²⁹ Codified in Chapter 19.285 RCW, the energy conservation section requires each qualifying utility to “pursue all available conservation that is cost-effective, reliable and feasible.” Seventeen utilities, representing about 84 percent of Washington’s load, currently meet the definition of qualifying utility.

The law requires utilities to use the Northwest Power and Conservation Council’s methodology to determine their achievable cost-effective conservation potential every two years for the subsequent ten-year period. Utilities also must establish and update a biennial conservation acquisition every two years. If a utility does not meet its conservation goals, it must pay an administrative fine for each MWh of shortfall, starting at \$50 and adjusting annually for inflation beginning in 2007.²³⁰

The Northwest Power and Conservation Council approved its Sixth Power Plan, in 2010. The Power Plan is a regional energy blueprint that guides the region’s electric utilities. Covering the 20 year period from 2010-2020, the Power Plan called for 6,000 – 7,000 average megawatts of conservation savings to meet 85 percent of the region’s load growth.²³¹ The Pacific Northwest is on track to meet this goal, and expects to continue investing heavily in efficiency. Under federal law, the Council revises the 20-year plan every five years.

Washington’s private and public utilities also have long records of offering customer energy efficiency and conservation programs supported by regional organizations including the Northwest Energy Efficiency Alliance. The Northwest Energy Efficiency Alliance seeks to

²²⁸ Calculated from U.S. Energy Information Administration data. CO₂ emissions based on Total Electric Power Industry category. EIA State Electric Power Emissions, *supra* note 4. Electricity generation data represents the total electricity generated from all electricity generation sources in the state, not just fossil fuel-fired sources EIA State Generation, *supra* note 4.

²²⁹ Energy Independence Act, Washington Initiative Measure No. 937, <http://www.secstate.wa.gov/elections/initiatives/text/i937.pdf>.

²³⁰ ACEEE, State Energy Efficiency Policy Database: Washington, [http://aceee.org/sector/state-policy/washington#Energy Efficiency Resource Standards](http://aceee.org/sector/state-policy/washington#Energy%20Efficiency%20Resource%20Standards) (last updated Aug. 12, 2013).

²³¹ Northwest Power and Conservation Council, Power Planning, <http://www.nwcouncil.org/energy/powerplan/>.

transform markets for energy efficient products. Its market transformation program impacts consumer goods, as well as building codes, design, construction and operations.²³²

Washington has also taken significant steps to increase renewable resources. In addition to conservation requirements, ballot initiative 937 set new renewable energy resource requirements for electric utilities. Codified in Chapter 19.285 RCW, the law requires qualifying utilities to meet 15 percent of their electric load with new renewable energy by 2020.

According to the Utilities and Transportation Commission, in 2012 Washington's investor-owned electric utilities, which combined serve about half the state of Washington's residents, generated or acquired 2.35 million megawatt hours of new clean electricity.²³³ This only includes energy generated from new renewable projects, and not energy generated from the region's considerable fleet of older hydroelectric dams. According to the Washington State Energy Office, in 2012 state of Washington produced about 73 percent of its electricity from carbon-free sources.²³⁴

And this new renewable energy is not as expensive as many claimed it would be when the law was passed by Washington's voters. The investor owned utilities' filings show that complying with the RPS only cost their customers an additional \$35 million in 2012 — an increase to the average household bill of 1.2 percent, or a little over \$1 a month.²³⁵

Finally, Washington will achieve significant further reductions through the early closure of its only coal-fired power plant. In 2011 the Washington State Legislature passed, and the Governor signed into law, legislation requiring the closure of the only coal powered electricity plant located in Washington. The Centralia plant was the largest single source greenhouse gas emission in the state, and through the deal closes one coal boiler in 2020 and the other by 2025. Additionally, the plant will meet a schedule of emissions reductions along the way.²³⁶

²³² Northwest Energy Efficiency Alliance, Market Transformation, <http://neea.org/about-neea/market-transformation>.

²³³ Washington Utilities and Transportation Commission, Renewable Energy, <http://www.utc.wa.gov/regulatedIndustries/utilities/energy/Pages/renewalEnergy.aspx>.

²³⁴ Washington Dept. of Commerce State Energy Office, Fuel Mix Disclosure, <http://www.commerce.wa.gov/Programs/Energy/Office/Utilities/Pages/FuelMix.aspx>.

²³⁵ Washington Utilities and Transportation Commission, Company Annual Reports, <http://www.utc.wa.gov/regulatedIndustries/utilities/energy/Pages/CompanyAnnualReports.aspx>.

²³⁶ Coal-Fired Electric Generation Facilities, ch. 180, 2011 Wash. Laws 1330, <http://www.leg.wa.gov/CodeReviser/documents/sessionlaw/2011pam2.pdf>.

From: Knapp, Kristien
To: McCabe, Janet
CC: Goffman, Joseph; Stewart, Lori
Sent: 9/5/2014 5:39:54 PM
Subject: Biogenic CO2 talking points
Attachments: Biogenic CO2 Talking Points 3rd Floor 082614.docx

Janet - these were given to the Administrator for her 8/26 call with Senator Shaheen. Joe asked me to send you a copy, paper copy is also in your folder.

From: Wiedeman, Allison
To: Goffman, Joseph
CC: McCabe, Janet
Sent: 8/27/2014 8:38:51 AM
Subject: RE: Biomass talking points

Thank you Joe – this is extremely helpful

From: Goffman, Joseph
Sent: Tuesday, August 26, 2014 11:07 PM
To: Wiedeman, Allison
Cc: McCabe, Janet
Subject: Fwd: Biomass talking points

Just FYI on biomass and the accounting framework. Thanks

- Joseph Goffman
Sent from my iPhone

Begin forwarded message:

From: "Kocchi, Suzanne" <Kocchi.Suzanne@epa.gov>
Date: August 26, 2014 at 11:13:35 AM EDT
To: "Goffman, Joseph" <Goffman.Joseph@epa.gov>, "Lewis, Josh" <Lewis.Josh@epa.gov>
Cc: "Tsirigotis, Peter" <Tsirigotis.Peter@epa.gov>, "Dunham, Sarah" <Dunham.Sarah@epa.gov>, "Gunning, Paul" <Gunning.Paul@epa.gov>, "Irving, Bill" <Irving.Bill@epa.gov>, "Friedman, Kristina" <Friedman.Kristina@epa.gov>, "Krieger, Jackie" <Krieger.Jackie@epa.gov>, "Niebling, William" <Niebling.William@epa.gov>, "Haman, Patricia" <Haman.Patricia@epa.gov>
Subject: RE: Biomass talking points

All – I spoke with Joe and edited the document per his suggestions. I have also included the edits from Peter received in a separate thread. I have attached the document for those who can review easier with the actual document file and pasted text below for those that can see better that way. Hopefully this captures everything. Thanks – Suzie

Biogenic CO2 Talking Points

(b) (5)



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From: Goffman, Joseph
Sent: Tuesday, August 26, 2014 10:18 AM
To: Lewis, Josh
Cc: Kocchi, Suzanne; Tsigotis, Peter; Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie; Niebling, William; Haman, Patricia
Subject: Re: Biomass talking points

Excellent. Thanks.

- Joseph Goffman
Sent from my iPhone

On Aug 26, 2014, at 10:07 AM, "Lewis, Josh" <Lewis.Josh@epa.gov> wrote:

Pat spoke to Shaheen's staffer. Here's what he said:

There are a lot of biomass-based power plants coming on line.

NH has a lot of forest products.

Her questions are in the context of 111(d):

When will the framework be done and will it encourage biomass-based power? What will the framework look like?

(Pat also heard that Shaheen met with Mr. Podesta last week and he suggested she follow up with the Administrator)

Josh Lewis
EPA/Office of Congressional and Intergovernmental Relations
Desk: 202 564 2095
Cell: 202 329 2291

From: Goffman, Joseph
Sent: Tuesday, August 26, 2014 9:58 AM
To: Kocchi, Suzanne
Cc: Tsirigotis, Peter; Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie; Niebling, William; Lewis, Josh
Subject: Re: Biomass talking points

Thanks. Does OCIR have any priors on what the Senator's specific issues are? Also, per my discussion with Sarah, we need to include actual TPs for the Administrator. Finally, Suzi, what is your direct dial? Thanks.

- Joseph Goffman
Sent from my iPhone

On Aug 26, 2014, at 9:40 AM, "Kocchi, Suzanne" <Kocchi.Suzanne@epa.gov> wrote:

Apparently 3 pm today.

From: Goffman, Joseph
Sent: Tuesday, August 26, 2014 9:18 AM
To: Kocchi, Suzanne
Cc: Tsirigotis, Peter; Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie
Subject: Re: Biomass talking points

Thanks for getting this done so quickly. Will review once Peter has a chance to look at. When does this need to go to the Third Floor?

- Joseph Goffman
Sent from my iPhone

On Aug 26, 2014, at 8:36 AM, "Kocchi, Suzanne" <Kocchi.Suzanne@epa.gov> wrote:

<image002.gif>

Joe, Peter – Below are the bullets we plan to add to the talking points doc for Admin and Senator. Also attached in the main document and highlighted in yellow so you can see where we are proposing to insert them. Please let us know if you have any comments/concerns. Thanks- Suzie

(b) (5)



(b) (5)



From: Niebling, William
Sent: Monday, August 25, 2014 6:33 PM
To: Dunham, Sarah; Gunning, Paul; Kocchi, Suzanne
Cc: Friedman, Kristina
Subject: FW: Biomass talking points

Sarah – read your note again and realize I left off Paul and Suzanne last time. Now you all get a copy – sorry.

From: Niebling, William
Sent: Monday, August 25, 2014 6:17 PM
To: Dunham, Sarah
Cc: Goffman, Joseph
Subject: FW: Biomass talking points

Sarah, here are the attachments.

From: Lewis, Josh
Sent: Monday, August 25, 2014 3:12 PM
To: Terry, Sara; Ashley, Jackie
Cc: Niebling, William; Haman, Patricia
Subject: RE: Biomass talking points

Anything new on the biomass deferral issue since the attached were drafted in early July? The Administrator may have a call w/ Senator Shaheen (NH) in the next couple of days.

Josh

From: Lubetsky, Jonathan
Sent: Wednesday, July 02, 2014 12:15 PM
To: Haman, Patricia; Terry, Sara
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

I take that back. OGC sent other edits after they said they were clear.

Clean and redline attached.

From: Lubetsky, Jonathan
Sent: Wednesday, July 02, 2014 12:08 PM
To: Haman, Patricia; Terry, Sara
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

OGC and Joe G. have cleared the document. Minor date change and grammatical edit made.

Thank you

From: Haman, Patricia
Sent: Wednesday, July 02, 2014 10:41 AM
To: Lubetsky, Jonathan; Terry, Sara
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

We now have a little more time – apparently she can't leave at 12:30 now.

Patricia Haman
Office of Congressional Affairs
U.S. EPA
202-564-2806

From: Lubetsky, Jonathan
Sent: Wednesday, July 02, 2014 10:39 AM
To: Terry, Sara; Haman, Patricia
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

I am checking on IO clearance. Please update the date on the document in the meantime.

From: Terry, Sara
Sent: Wednesday, July 02, 2014 10:10 AM
To: Haman, Patricia
Cc: Lewis, Josh; Lubetsky, Jonathan; Niebling, William
Subject: RE: Biomass talking points
Importance: High

Pat,
Here is our draft – I've attached track changes and clean versions. I'd like Jonathan to weigh in on whether this needs IO clearance.

Thanks,
Sara

From: Haman, Patricia
Sent: Wednesday, July 02, 2014 9:31 AM
To: Terry, Sara
Cc: Lewis, Josh; Lubetsky, Jonathan; Niebling, William
Subject: RE: Biomass talking points

I am very sorry but Nichole just learned the Administrator has decided to leave earlier than originally scheduled so we need this by noon. Can you make that happen???? Pat

Patricia Haman
Office of Congressional Affairs
U.S. EPA
202-564-2806

From: Haman, Patricia
Sent: Tuesday, July 01, 2014 12:02 PM
To: Terry, Sara
Cc: Lewis, Josh; Lubetsky, Jonathan; Niebling, William
Subject: Biomass talking points

Sara: As discussed, here is the cleared version from 3/12 with a few suggested revisions I made to get the ball rolling.

The Administrator is meeting with Senator King next week but Nichole would like to give her this revised paper tomorrow afternoon.

Nichole is primarily interested in the question of what happens when the deferral expires on 7/21 and also would like to make sure that the portion of the paper addressing the Supreme Court decision is updated. I used an internal Q&A we received from OGC to address the latter point but would appreciate help fleshing it out as well as any other changes you believe are needed.

Thanks, Pat

Patricia Haman
Office of Congressional Affairs
U.S. EPA
202-564-2806

<Biomass Deferral talking points 07 02 14 CLEAN + ogc+OAPv2.docx>

From: Goffman, Joseph
To: McCabe, Janet
Sent: 2/11/2014 6:56:26 PM
Subject: Fw: Catch up
Attachments: Air Issues AF&PA slides v1 2-12-14.pptx

From: Noe, Paul <Paul_Noe@afandpa.org>
Sent: Tuesday, February 11, 2014 6:55:02 PM
To: Goffman, Joseph
Subject: RE: Catch up

Joe: Please see attached.

Best regards

Paul

Paul Noe
Vice President for Public Policy
Paul_Noe@afandpa.org
(202) 463-2777
AMERICAN FOREST & PAPER ASSOCIATION
1101 K Street, N.W., Suite 700
Washington, D.C. 20005

-----Original Message-----

From: Goffman, Joseph [mailto:Goffman.Joseph@epa.gov]
Sent: Tuesday, February 11, 2014 6:32 PM
To: Noe, Paul
Subject: Re: Catch up

Very helpful. Thanks.

From: Noe, Paul <Paul_Noe@afandpa.org>
Sent: Tuesday, February 11, 2014 4:05:45 PM
To: Goffman, Joseph
Subject: RE: Catch up

Joe: Would it be helpful if I sent you slides on the issues we want to cover when we see you?

Paul

-----Original Message-----

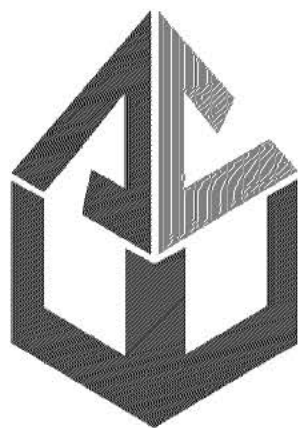
From: Goffman, Joseph [mailto:Goffman.Joseph@epa.gov]
Sent: Tuesday, February 11, 2014 12:57 PM
To: Noe, Paul
Subject: Re: Catch up

Sure. I have a long day scheduled. Would 7 or 8 be too late?

From: Noe, Paul <Paul_Noe@afandpa.org>
Sent: Tuesday, February 11, 2014 12:48:39 PM
To: Goffman, Joseph
Subject: Catch up

Joe: can I catch you by phone briefly at end of the day -- after 5pm?

Paul Noe



AMERICAN
WOOD
COUNCIL



American
Forest & Paper
Association

Critical Clean Air Issues for Forest Products Industry

February 12, 2014

Issues

- Sustainable Regulation
 - Economic
 - Environmental
 - Social
- Boiler MACT
- NAAQS Permit Gridlock
- Biogenic CO₂ – carbon neutral

Boiler MACT

- Long collaborative effort with EPA – concerned about legal vulnerability
 - Fully address small data set issue (UPL) – notice and comment
 - Sever UPL from other litigation and reconsideration issues
 - Toll compliance date for rule - provide time for capital planning and investment once we have certainty
- Reconsideration proposal delayed
 - Start-up and Shutdown - put options in docket to avoid logical outgrowth concerns
 - Technical fixes – very important to implementation
- Serious business uncertainty and risk

NAAQS Permit Gridlock

- Appreciate industry coalition meeting last week – resources and leadership key; timely action urgently needed
- Lower and lower standards approaching background
- Standard setting has outpaced implementation tools and guidance
- Policies around modeling inputs and emission estimates overly conservative
- Tighter Ozone NAAQS will only make permitting more difficult – near nationwide non-attainment

NAAQS Permit Gridlock

- Recommend returning to PM₁₀ (filterables only) surrogacy policy for Forest Products requiring no PM_{2.5} demonstration until:
 - Properly treat PM₁₀ condensibles
 - Adequate test methods for PM_{2.5} developed
 - Develop reliable fugitive data
 - Allow alternative methods for wet sources and low emitting sources
 - industry committed to help
- Receptor adjustments (ambient air) – focus on true exposure
- Emissions variability – probabilistic/Monte Carlo or ranges
- Adopt “beta” options as defaults (LOWWIND, ARM2)
- SERs/SILs critical for direct and precursor emissions for PM_{2.5}/ozone precursors
- Background concentrations – use of local monitoring in lieu of modeling for attainment or compliance demonstration

Biogenic CO₂

- Appreciate the good exchange of information and ideas
- Accounting Framework should classify as carbon neutral:
 - forest product manufacturing residuals and
 - other biomass from “sink regions” (growth > harvest in US)
- EPA has legal discretion to exclude biogenic CO₂ from PSD applicability determinations

From: McCabe, Janet
To: Goffman, Joseph
Sent: 12/18/2013 10:23:24 PM
Subject: biomass
Attachments: biomass update 12-19-13 jm.docx

Try this.

From: McCabe, Janet
To: Goffman, Joseph
Sent: 12/17/2013 11:44:49 PM
Subject: RE: Biomass Briefing Document

just read it....will not make for a good briefing. le'ts talk tomorrow.

From: Goffman, Joseph
Sent: Tuesday, December 17, 2013 10:09 PM
To: McCabe, Janet; Stewart, Lori
Subject: Biomass Briefing Document

Perhaps we will have time to discuss at morning meeting.

Am reviewing briefing documents for Thursday Administrator update.

(b)(5) deliberative

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Thanks.

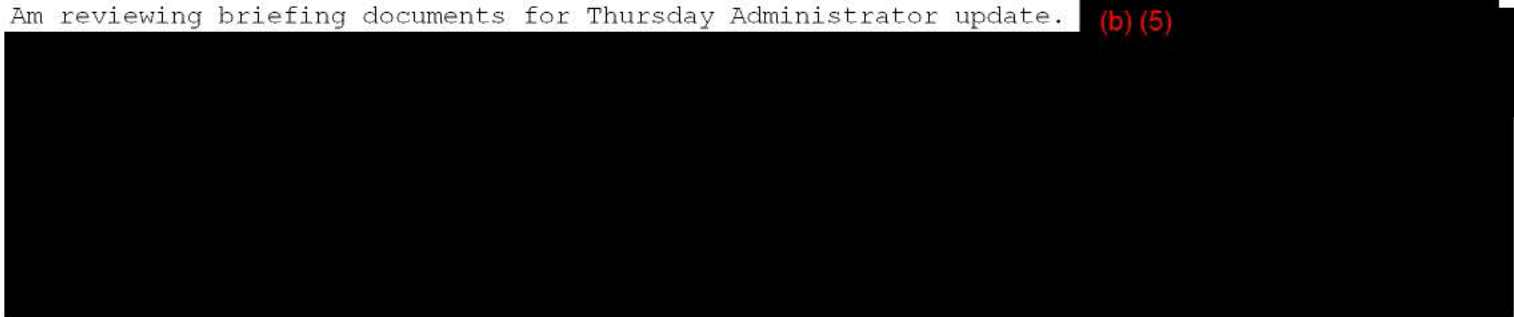
From: McCabe, Janet
To: Goffman, Joseph; Stewart, Lori
Sent: 12/17/2013 10:57:51 PM
Subject: RE: Biomass Briefing Document

next on my list.

From: Goffman, Joseph
Sent: Tuesday, December 17, 2013 10:09 PM
To: McCabe, Janet; Stewart, Lori
Subject: Biomass Briefing Document

Perhaps we will have time to discuss at morning meeting.

Am reviewing briefing documents for Thursday Administrator update. (b) (5)



Thanks.

From: Goffman, Joseph
To: McCabe, Janet; Stewart, Lori
Sent: 12/17/2013 10:09:02 PM
Subject: Biomass Briefing Document

Perhaps we will have time to discuss at morning meeting.

Am reviewing briefing documents for Thursday Administrator update.

(b) (5)



Thanks.

From: Stewart, Lori
To: Goffman, Joseph
CC: McCabe, Janet; Knapp, Kristien
Sent: 11/25/2013 5:27:11 PM
Subject: RE: Please don't forget

We flagged the meeting last week but we did not have these topics. I have not seen material. I will check with OAQPS and OAP.

From: Goffman, Joseph
Sent: Monday, November 25, 2013 5:16 PM
To: Stewart, Lori
Cc: McCabe, Janet
Subject: Fw: Please don't forget

Do we know how the Third Floor is prepping for this? Have we submitted material? Thanks.

From: Noe, Paul <Paul_Noe@afandpa.org>
Sent: Monday, November 25, 2013 5:13:28 PM
To: Goffman, Joseph
Subject: RE: Please don't forget

Joe: Thanks again for meeting with us today.

Donna will likely raise the following issues with Gina tomorrow:

- The cumulative burden of clean air regulations and the need for fundamental reform because the system is not sustainable
- carbon neutrality of biomass and the greenhouse gas regulations
- NAAQS permitting gridlock and boiler MACT implementation

Best regards,

Paul

Paul Noe
Vice President for Public Policy
AMERICAN FOREST & PAPER ASSOCIATION
Effective November 18, our new address will be:
1101 K Street, NW, Suite 700, Washington, D.C. 20005
Paul_Noe@afandpa.org
202-463-2777 (phone)
202-463-2772 (fax)
www.afandpa.org

 email signature image 2.jpg

From: Goffman, Joseph [<mailto:Goffman.Joseph@epa.gov>]
Sent: Monday, November 25, 2013 3:36 PM
To: Noe, Paul
Subject: Please don't forget

To send me the priors on tomorrow's meeting – carbon neutrality, bottleneck, anything else? Thanks.

Joseph Goffman
Senior Counsel to the Assistant Administrator
Office of Air and Radiation
US EPA
202 564 3201

From: Atkinson, Emily on behalf of McCabe, Janet
To: Goffman, Joseph; Drinkard, Andrea; OARINVITATIONS
Sent: 1/17/2014 3:57:07 PM
Subject: AF&PA Environment Resource Committee Meeting (Confirmed)
Attachments: Fw: McCabe Meeting Request; Janet McCabe Event Form.docx; McCabe Meeting Request 021214.pdf; RE: McCabe Meeting Request

From: Emily McGlynn
To: Goffman, Joseph
CC: Duke, Rick (b) (6); West, Tris; Cole, Jefferson; Irving, Bill; Dunham, Sarah; Gunning, Paul; Browne, Cynthia
Sent: 4/8/2015 9:12:32 PM
Subject: Re: Biomass co-firing in the Clean Power Plan

Thanks for the quick response, I'll take this offline with Cynthia.

Best,
 Emily

On Wed, Apr 8, 2015 at 8:35 PM, Goffman, Joseph <Goffman.Joseph@epa.gov> wrote:

Hi, Emily. Thank you very much for your thoughtful note. We would be happy to set up an EPA call or meeting. Please work with Cynthia to set something up. Thanks.

From: Emily McGlynn [mailto:emily.mcglynn@teplp.com]
Sent: Wednesday, April 08, 2015 6:50 PM
To: Duke, Rick; Goffman, Joseph
Cc: (b) (6); West, Tris; Cole, Jefferson; Irving, Bill
Subject: Biomass co-firing in the Clean Power Plan

Dear Rick and Joe,

You might recall that we had meetings (one with CEQ, one with EPA) last fall to discuss the role of biomass co-firing in the Clean Power Plan. We know EPA is hard at work finalizing the rule while also managing the development of the Biogenic Accounting Framework. We have also seen Assistant Administrator McCabe's letter from November 19 2014. Based on numerous discussions with a variety of stakeholders on the potential role of biomass co-firing as a compliance strategy in the Clean Power Plan, we wanted to call this issue to your attention again for several reasons.

First, our understanding is the legal basis for regulating emissions from biomass combustion distinctly from fossil fuels has never been confirmed, nor has the technical approach for biomass emissions accounting. The DC Circuit Court of Appeals vacated EPA's 2011 attempt to defer regulation of biomass emissions until it could finalize a science-based approach, on process-related grounds, but left "for another day the question whether the agency has authority under the Clean Air Act to permanently exempt biogenic carbon dioxide sources..." We would suggest that, however EPA finalizes its decision-making on biomass eligibility with regards to the Clean Power Plan, it ensures strong legal footing under the Clean Air Act and avoids any related legal uncertainty for states, regulated entities, and the private sector. This legal analysis should be considered a political priority, not a technical detail.

Second, the McCabe letter helpfully answers some questions regarding how biomass will be handled under the Clean Power Plan but raises others. Key remaining questions include:

- Can biomass be used in coal plants, in addition to dedicated new build biopower?
- What kinds of biomass will qualify for waste, residue, and sustainably harvested categories?
- Will these categories be defined by EPA or will each state have discretion?
- Will these questions be answered imminently in order to inform state's planning processes, or only upon EPA's review of their plans?

When we talk about these issues with various stakeholders, getting clarity on these questions is a recurrent theme. States need to understand these issues so they can develop their implementation plans in good faith, and regulated facilities need to assess mitigation options.

We would note that biomass co-firing is likely the only significant cost-effective option for inside-the-fence measures available to coal-fired power plants other than efficiency improvements. Analysis by the Rocky Mountain Institute and The Earth Partners suggests that the technical potential for co-firing sustainable biomass categories like wastes, residues, and sustainable forest material could offset over one quarter of today's U.S. coal power consumption. Facilitating co-firing of sustainably-sourced biomass as a compliance option can provide an important off-ramp for utilities with significant coal fired assets, helping improve the political feasibility of 111(d) while bolstering degraded land restoration and other land management priorities in rural and agricultural communities.

We think prioritization and clarification of these issues with key stakeholders like states and regulated entities would be very helpful. My colleagues and I would like to share additional recommendations for how these issues can be handled that would be useful to discuss in a follow-up call or meeting.

Best regards,
Emily

--

Emily McGlynn | Manager | The Earth Partners
2 Bethesda Metro Ctr Ste 850, Bethesda MD 20814
(202) 487-8136
www.theearthpartners.com



--

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(202) 487-8136
www.theearthpartners.com



From: Goffman, Joseph
To: Emily McGlynn; Duke, Rick
CC: (b) (6) West, Tris; Cole, Jefferson; Irving, Bill; Dunham, Sarah; Gunning, Paul; Browne, Cynthia
Sent: 4/8/2015 8:35:51 PM
Subject: RE: Biomass co-firing in the Clean Power Plan

Hi, Emily. Thank you very much for your thoughtful note. We would be happy to set up an EPA call or meeting. Please work with Cynthia to set something up. Thanks.

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Sent: Wednesday, April 08, 2015 6:50 PM
To: Duke, Rick; Goffman, Joseph
Cc: (b) (6) West, Tris; Cole, Jefferson; Irving, Bill
Subject: Biomass co-firing in the Clean Power Plan

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We think prioritization and clarification of these issues with key stakeholders like states and regulated entities would be very helpful. My colleagues and I would like to share additional recommendations for how these issues can be handled that would be useful to discuss in a follow-up call or meeting.

Best regards,
Emily

--

Emily McGlynn | Manager | The Earth Partners
2 Bethesda Metro Ctr Ste 850, Bethesda MD 20814
(202) 487-8136
www.theearthpartners.com



From: Niebling, William
To: Kocchi, Suzanne; Goffman, Joseph; Lewis, Josh
CC: Tsirigotis, Peter; Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie; Haman, Patricia
Sent: 8/26/2014 11:37:13 AM
Subject: RE: Biomass talking points

Thanks, Suzie, for the quick turnaround!

Joe, Peter, Sarah – fine to tell OCIR this is final?

Josh & Pat – if no further word by 3pm, consider this the final version.

From: Kocchi, Suzanne
Sent: Tuesday, August 26, 2014 11:14 AM
To: Goffman, Joseph; Lewis, Josh
Cc: Tsirigotis, Peter; Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie; Niebling, William; Haman, Patricia
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Biogenic CO2 Talking Points

(b) (5)



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Subject: RE: Biomass talking points
Attachments: Biogenic CO2 Talking Points 3rd Floor 082614.docx

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To: Tsirigotis, Peter; Goffman, Joseph
CC: Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie
Sent: 8/26/2014 10:43:16 AM
Subject: RE: Biomass talking points

Thanks. Will include in the next version that I will circulate. I also just spoke to Joe.

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Sent: Tuesday, August 26, 2014 10:40 AM
To: Kocchi, Suzanne; Goffman, Joseph
Cc: Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie
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CC: Tsirigotis, Peter; Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie; Niebling, William; Haman, Patricia
Sent: 8/26/2014 10:07:49 AM
Subject: RE: Biomass talking points

Pat spoke to Shaheen's staffer. Here's what he said:

There are a lot of biomass-based power plants coming on line.

NH has a lot of forest products.

Her questions are in the context of 111(d):

When will the framework be done and will it encourage biomass-based power? What will the framework look like?

(Pat also heard that Shaheen met with Mr. Podesta last week and he suggested she follow up with the Administrator)

Josh Lewis
 EPA/Office of Congressional and Intergovernmental Relations
 Desk: 202 564 2095
 Cell: 202 329 2291

From: Goffman, Joseph
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- Prior to release we will engage with key stakeholders such as AF&PA and NAFO

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Sent: Wednesday, July 02, 2014 9:31 AM
To: Terry, Sara
Cc: Lewis, Josh; Lubetsky, Jonathan; Niebling, William
Subject: RE: Biomass talking points

I am very sorry but Nichole just learned the Administrator has decided to leave earlier than originally scheduled so we need this by noon. Can you make that happen???? Pat

Patricia Haman
Office of Congressional Affairs
U.S. EPA
202-564-2806

From: Haman, Patricia
Sent: Tuesday, July 01, 2014 12:02 PM
To: Terry, Sara
Cc: Lewis, Josh; Lubetsky, Jonathan; Niebling, William
Subject: Biomass talking points

Sara: As discussed, here is the cleared version from 3/12 with a few suggested revisions I made to get the ball rolling.

The Administrator is meeting with Senator King next week but Nichole would like to give her this revised paper tomorrow afternoon.

Nichole is primarily interested in the question of what happens when the deferral expires on 7/21 and also would like to make sure that the portion of the paper addressing the Supreme Court decision is updated. I used an internal Q&A we received from OGC to address the latter point but would appreciate help fleshing it out as well as any other changes you believe are needed.

Thanks, Pat

Patricia Haman
Office of Congressional Affairs
U.S. EPA
202-564-2806

<Biomass Deferral talking points 07 02 14 CLEAN + ogc+OAPv2.docx>

From: Kocchi, Suzanne
To: Goffman, Joseph; Tsirigotis, Peter
CC: Dunham, Sarah; Gunning, Paul; Irving, Bill; Friedman, Kristina; Krieger, Jackie
Sent: 8/26/2014 8:36:27 AM
Subject: FW: Biomass talking points
Attachments: Biomass Deferral talking points 07 02 14 CLEAN + ogc+OAPv2.docx

Joe, Peter – Below are the bullets we plan to add to the talking points doc for Admin and Senator. Also attached in the main document and highlighted in yellow so you can see where we are proposing to insert them. Please let us know if you have any comments/concerns. Thanks- Suzie

(b) (5)



(b) (5)

From: Niebling, William
Sent: Monday, August 25, 2014 6:33 PM
To: Dunham, Sarah; Gunning, Paul; Kocchi, Suzanne
Cc: Friedman, Kristina
Subject: FW: Biomass talking points

Sarah – read your note again and realize I left off Paul and Suzanne last time. Now you all get a copy – sorry.

From: Niebling, William
Sent: Monday, August 25, 2014 6:17 PM
To: Dunham, Sarah
Cc: Goffman, Joseph
Subject: FW: Biomass talking points

Sarah, here are the attachments.

From: Lewis, Josh
Sent: Monday, August 25, 2014 3:12 PM
To: Terry, Sara; Ashley, Jackie
Cc: Niebling, William; Haman, Patricia
Subject: RE: Biomass talking points

Anything new on the biomass deferral issue since the attached were drafted in early July? The Administrator may have a call w/ Senator Shaheen (NH) in the next couple of days.

Josh

From: Lubetsky, Jonathan
Sent: Wednesday, July 02, 2014 12:15 PM
To: Haman, Patricia; Terry, Sara
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

I take that back. OGC sent other edits after they said they were clear.

Clean and redline attached.

From: Lubetsky, Jonathan
Sent: Wednesday, July 02, 2014 12:08 PM
To: Haman, Patricia; Terry, Sara
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

OGC and Joe G. have cleared the document. Minor date change and grammatical edit made.

Thank you

From: Haman, Patricia
Sent: Wednesday, July 02, 2014 10:41 AM
To: Lubetsky, Jonathan; Terry, Sara
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

We now have a little more time – apparently she can't leave at 12:30 now.

Patricia Haman
Office of Congressional Affairs
U.S. EPA
202-564-2806

From: Lubetsky, Jonathan
Sent: Wednesday, July 02, 2014 10:39 AM
To: Terry, Sara; Haman, Patricia
Cc: Lewis, Josh; Niebling, William
Subject: RE: Biomass talking points

I am checking on IO clearance. Please update the date on the document in the meantime.

From: Terry, Sara
Sent: Wednesday, July 02, 2014 10:10 AM
To: Haman, Patricia
Cc: Lewis, Josh; Lubetsky, Jonathan; Niebling, William
Subject: RE: Biomass talking points
Importance: High

Pat,
Here is our draft – I've attached track changes and clean versions. I'd like Jonathan to weigh in on whether this needs IO clearance.

Thanks,
Sara

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Office of Congressional Affairs
U.S. EPA
202-564-2806

From: Noe, Paul
To: Goffman, Joseph
CC: Lancey, Stan; Dunham, Sarah; Gunning, Paul; Jenkins, Jennifer; Ohrel, Sara; Irving, Bill; Santiago, Juan; Wood, Anna; Browne, Cynthia; Kocchi, Suzanne
Sent: 10/10/2013 12:37:51 PM
Subject: NCASI Study, Biomass Energy from Forest Products Manufacturing Residuals
Attachments: AFPA-AWC Summary NCASI Study Manufacturing Residuals 10-9-13.f.pdf

Dear Joe:

I wanted to let you know that earlier this week, NCASI posted the final version of their report, "Greenhouse Gas and Fossil Fuel Reduction Benefits of Using Biomass Manufacturing Residuals for Energy Production in Forest Products Facilities." The study is based on a robust dynamic analysis.

As explained in the attached summary prepared by AF&PA, the study shows large greenhouse gas reduction benefits from using manufacturing residuals (such as black liquor, bark, sawdust, paper recycling residuals, and waste water treatment residuals) for energy in the forest products industry – avoiding the emission of approximately 218 million metric tons of CO₂e annually. (This is equivalent to removing over 40 million cars from the road.) This includes both fossil fuel displacement benefits as well as avoided biogenic greenhouse gas emissions that would occur from disposing of the residuals, such as through landfilling or incineration.

Even if the benefits of fossil fuel displacement are set aside under a narrower "alternative fate" perspective, the benefits of using manufacturing residuals for energy rather than disposing of them are still large – by our estimate, about 53 million metric tons of CO₂e avoided annually, the equivalent of removing about 10 million cars from the road.

A link to the study is below. Please let me know if you have any questions.

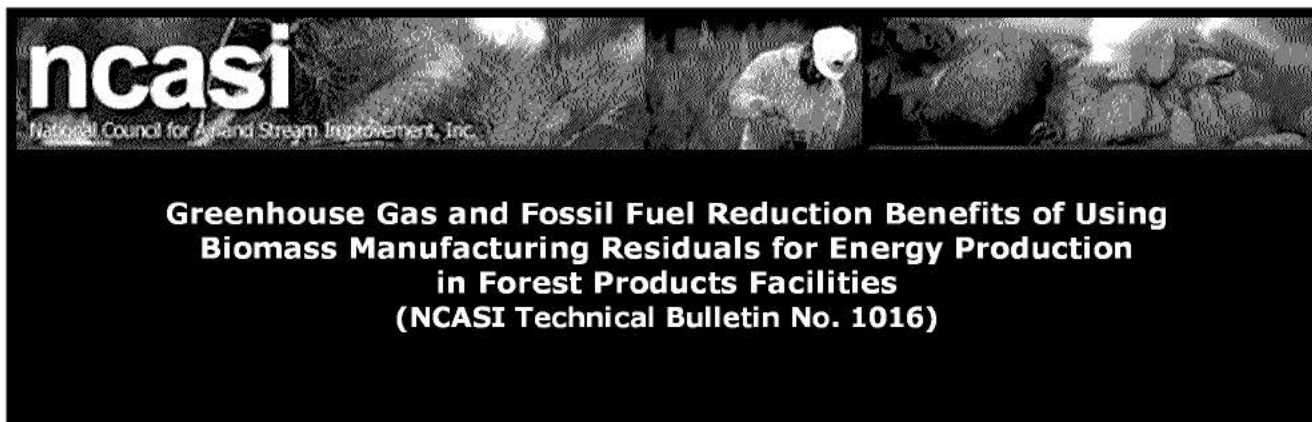
Once the current funding issue is resolved, we would like to make this a part of the agenda for the meeting with you and your colleagues that has to be rescheduled.

Thank you for your consideration.

Best regards,

Paul

If you are unable to view this email, [click here](#) for a web version.
To view a text version of this, [click here](#).



NCASI recently posted a new report, Technical Bulletin No. 1016, on its website at www.ncasi.org. Member company employees, as well as government and academic personnel, may request a printed complimentary copy of this report by replying to this message or calling (352) 331-1745. The PDF file is freely available to the public for download.

NCASI Technical Bulletin No. 1016: Greenhouse Gas and Fossil Fuel Reduction Benefits of Using Biomass Manufacturing Residuals for Energy Production in Forest Products Facilities

[Bulletin technique no. 1016 : Avantages liés à la réduction des émissions de gaz à effet de serre et de la consommation d'énergie fossile de l'utilisation de résidus manufacturiers de biomasse pour la production d'énergie par les usines de produits forestiers]

NCASI continues its work to address the United States Environmental Protection Agency's expressed interest in the life cycle greenhouse gas benefits associated with using biomass. The regulatory decisions EPA makes on this topic have the potential to greatly affect the costs of doing business and the perception of forest industry's products in the marketplace. The forest products industry, therefore, has a great deal at stake in ensuring that the agency's deliberations on this topic are well informed.

In an earlier report, NCASI examined the life cycle greenhouse gas and non-renewable energy benefits of using black liquor in the kraft recovery system. In the study described herein, NCASI extends this work to other types of biomass-based manufacturing residuals used for energy generation within the industry. While there are numerous studies examining the life cycle impacts of biomass energy, none has applied the comprehensive approach used here by NCASI to characterize the impacts of the industry's use of energy produced from biomass residuals.

In this study, NCASI has compared systems involving the use of biomass-based manufacturing residuals for energy to comparable systems relying on fossil fuels. The results indicate that the industry's use of these manufacturing residuals for energy avoids the release of approximately 110 million metric tons of CO₂E per year.

Combining the results of this study with the results of the previous NCASI study on black liquor reveals that each year's use of biomass-based manufacturing residuals (including black liquor) in the US forest products industry avoids the emission of approximately 218 million metric tons of CO₂E, an amount more than three times the annual direct emissions of CO₂ from fossil fuel combustion in the industry.

This study is one of a series of ongoing NCASI projects having the objective of helping the forest products industry and its stakeholders better understand the greenhouse gas and energy impacts of using forest biomass as a raw material and fuel.

[List of recent NCASI Technical Bulletins >>](#)

This message is from the National Council for Air and Stream Improvement, an independent, non-profit research institute that focuses on environmental topics of interest to the forest products industry.
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P.O. Box 13318, Research Triangle Park, NC 27709 U.S.A.
(919) 941-6400

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From: Dave Tenny
To: Goffman, Joseph
Sent: 6/29/2015 11:11:50 AM
Subject: RE: My comments in Climate Daily News

Thanks, Joe. I think we all can agree that carbon neutrality is not a categorical proposition. Based on Dawn's description in the story, I think we are now both in the club of being characterized as propounding a categorical approach.

We'll keep in touch, Joe. Have a great 4th.

Dave

David P. Tenny
President and CEO
National Alliance of Forest Owners
122 C Street, NW, Suite 630
Washington, D.C. 20001
Office: (202) 747-0739
Fax: (202) 824-0770
Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Goffman, Joseph [mailto:Goffman.Joseph@epa.gov]
Sent: Saturday, June 27, 2015 8:55 AM
To: Dave Tenny
Subject: Re: My comments in Climate Daily News

Thanks, Dave. Sorry my cranky literal-mindedness got the better of me on Tuesday. As for the SAP, we are constrained to keep faith with our science peer review panel on the issue of categorical carbon neutrality, which, indeed, is not the premise on which the McCabe memo rests.

Have a good July 4th.

- Joseph Goffman
 Sent from my iPhone

On Jun 26, 2015, at 10:20 AM, Dave Tenny <dtenny@nafoalliance.org> wrote:

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I wanted to make sure you saw my comment in Climate Daily News below. This is a Dawn Reeves piece. The relevant stuff from me is in yellow. Note they misspelled my name in the third quote. It could be I am causing them some PTSD over biomass. I seem to have that effect on people.

Word on the street is that things got a bit hectic and confusing this week, so we aren't sure what to read into the SAP language. Needless to say the headline speaks for itself.

Have a great weekend, Joe.

Dave

Climate Daily News

Obama Veto Threat Over Biomass GHG Rider Draws Surprise From All Sides

Posted: June 24, 2015

Environmental and industry groups are reacting with surprise to the White House's announcement that it would veto the pending House fiscal year 2016 spending bill for EPA in part over its policy rider codifying the agency's plan to allow biomass energy to be considered a carbon-neutral compliance pathway for its power plant greenhouse gas (GHG) rule -- though the two sides are offering competing views of what this may mean.

Dave Tenny, CEO of the National Alliance of Forest Owners, tells *Inside EPA/climate* June 24 that the statement "is a bit bewildering" because it "seems to contradict what the administration has already said in the past about biomass carbon."

But one environmentalist calls the threat a "welcome surprise," suggesting it may put pressure on EPA to revise its policy. "Clearly someone in the administration is thinking about this intelligently. The statement is concise but it hits a lot of the right points."

And a second environmentalist says the statement is "a very good sign that the administration is still paying attention to the science, notwithstanding the troubling signals EPA has been sending."

At issue is the White House's June 23 Statement of Administration Policy (SAP) that threatens to veto the spending bill -- which the House is slated to approve by June 26 -- over language that appears to codify a controversial EPA memo indicating the agency believes "sustainable biomass" is a carbon-neutral fuel source that could be used by states to comply with the existing source performance standards (ESPS).

"The Administration objects to the bill's representation of forest biomass as categorically 'carbon-neutral.' This language conflicts with existing EPA policies on biogenic [carbon dioxide (CO₂)] and interferes with the position of States that do not apply the same policies to forest biomass as other renewable fuels like solar or wind. This language stands in contradiction to a wide-ranging consensus on policies and best available science from EPA's own independent Science Advisory Board (SAB), numerous technical studies, many States and various other stakeholders."

The SAP adds that if the measure reaches Obama's desk in its current form, his "senior advisors would recommend that he veto the bill."

EPA and White House spokespeople were unable to explain by press time how the biomass language ended up in the SAP.

But the threat appears to upend industry efforts in both the House and Senate -- which has included identical language in its EPA spending bill -- that appeared to align with EPA's position.

At the heart of the issue is whether combustion of biomass is carbon neutral. Labor and industry groups -- and EPA officials -- have generally argued the fuel source is carbon neutral because forest regrowth sequesters CO₂.

But environmentalists have strongly resisted the argument, charging that combustion of biomass results in a large and immediate release of CO₂ that can take decades to sequester.

EPA is consulting with its SAB on a proposed framework for estimating the emissions impact of biomass, though the SAB panel has been struggling to provide advice in part because the proposed framework is policy neutral.

Reflecting the divisions among labor and environmental groups, congressional Democrats have split on the issue.

Some, like Sens. Elizabeth Warren (D-MA) and Ed Markey (D-MA), have urged the administration to delay a biomass policy until the science is settled. But others, including several top House Democrats, have backed EPA and industry.

McCabe Memo

Even before the SAB completed its review of the framework, EPA air chief Janet McCabe last year issued the controversial memo that said the agency would consider sustainably derived biomass to be a carbon-neutral compliance option for its ESPS -- though the memo did not define sustainable biomass.

The appropriations language appeared to codify the agency's effort -- and add definitions of sustainability. It was derived from a stand-alone bill offered by Sen. Angus King (I-ME) that says the EPA administrator "shall assume that forest biomass emissions do not increase overall carbon accumulations in the atmosphere if 1) a Forest Inventory and Analysis of the Department of Agriculture that is current at the time the action is taken shows that forest carbon stocks in the United States are stable or increasing; or (2) the forest biomass is derived from mill residuals, harvest residuals or forest management activities."

King's office also could not be reached for comment at press time, but one bioenergy source says the SAP “makes me wonder whether they even read the appropriations language because no one is claiming that biomass gets a categorical exemption as carbon neutral. . . . And that's why you have to look at issues around sustainability. . . . The [appropriations] language mimics what EPA said in November.”

The SAP language is “completely weird. Someone needs to ask the White House what they're saying here,” the source says. The source also has “no clue” as to how it got in the veto threat.

NAFO's Tenny stresses strong bipartisan support in both chambers of Congress for biomass energy's use as a carbon-neutral fuel source, as well as fairly consistent support from the administration “at least up to now” that there should be a clear and simple biomass policy on bioenergy as a “solution to some of our carbon challenges.”

Terry adds that the SAP's criticism that the rider interferes with state renewable policies is off base because the language in the appropriations measures does not limit state authority but includes a savings clause that preserves existing state renewable policies.

Another industry source says the SAP language was “a bit strong and not completely expected” but suggests that doesn't mean the administration has made up its mind on biomass. Rather it shows the issue is “on the radar” and the administration is reminding people it is still in the process of reviewing it.

'Meaningful Distinctions'

But environmentalists are welcoming the SAP, saying it suggests that EPA may have to reverse course on the McCabe memo.

The second environmentalist says it is unclear where EPA is on the overall carbon neutrality issue but is hopeful that the SAP language suggests that the agency has heard the criticism and is refocusing. “It is very clear at this point that biomass cannot just be treated as carbon neutral even if it comes from sustainable forest management and even if forests are growing.”

And the first source says, “I don't think the White House can articulate this position [in the SAP] which is sensible, and at the same time move forward with the McCabe memo. They're going to either have to abandon that part of the McCabe memo or interpret it in a way that has much more meaningful distinctions [on sustainability] than has previously been attributed.”

This source says it is not yet clear whether it means that there is a split between EPA and the White House on the issue or if there's been “an evolution.” The source adds it is “absolutely right” to look at the language in the SAP and “note how it contradicts the way that most people have read the . . . McCabe memo.”

A third environmentalist notes, however, that the administration may be opposing the legislative language because it could be read as providing a broader waiver for biomass than what the McCabe memo does. The source says the language appears to count biomass as carbon neutral based on “any” forest management activity that could presumably include burning an entire forest.

Also, the bioenergy industry source and a fourth environmentalist suggest that EPA may have convinced the White House to include the biomass language in the SAP over opposition to having the issue legislated, rather than having changed its mind on using a sustainability criteria for biomass carbon neutrality.

The SAP language could be “the White House and EPA . . . resisting having Congress dictate what is and what isn't carbon neutral,” the industry source says.

The environmentalist agrees, noting that the language could be “EPA rearing up on its hind legs” in opposition to having its biomass policy dictated by legislation.

Environmental groups this week sent a letter to White House regulatory reviewers urging that biomass be removed as an ESPS compliance option, writing that emission reductions attributed to biomass are “uncertain, speculative, and dislocated, and cannot be relied upon for the purpose of [ESPS] compliance.”

But NAFO's Tenny called the letter “not a surprise” and stressed the carbon benefits of biomass are “well-founded in science” and “clearly stated” by the Department of Agriculture. -- Dawn Reeves (dreeves@iwpnews.com)

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Sent: 6/27/2015 8:55:13 AM
Subject: Re: My comments in Climate Daily News

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And a second environmentalist says the statement is “a very good sign that the administration is still paying attention to the science, notwithstanding the troubling signals EPA has been sending.”

At issue is the White House's June 23 Statement of Administration Policy (SAP) that threatens to veto the spending bill -- which the House is slated to approve by June 26 -- over language that appears to codify a controversial EPA memo indicating the agency believes “sustainable biomass” is a carbon-neutral fuel source that could be used by states to comply with the existing source performance standards (ESPS).

“The Administration objects to the bill's representation of forest biomass as categorically 'carbon-neutral.' This language conflicts with existing EPA policies on biogenic [carbon dioxide (CO₂)] and interferes with the position of States that do not apply the same policies to forest biomass as other renewable fuels like solar or wind. This language stands in contradiction to a wide-ranging consensus on policies and best available science from EPA's own independent Science Advisory Board (SAB), numerous technical studies, many States and various other stakeholders.”

The SAP adds that if the measure reaches Obama's desk in its current form, his “senior advisors would recommend that he veto the bill.”

EPA and White House spokespeople were unable to explain by press time how the biomass language ended up in the SAP.

But the threat appears to upend industry efforts in both the House and Senate -- which has included identical language in its EPA spending bill -- that appeared to align with EPA's position.

At the heart of the issue is whether combustion of biomass is carbon neutral. Labor and industry groups -- and EPA officials -- have generally argued the fuel source is carbon neutral because forest regrowth sequesters CO₂. But environmentalists have strongly resisted the argument, charging that combustion of biomass results in a large and immediate release of CO₂ that can take decades to sequester.

EPA is consulting with its SAB on a proposed framework for estimating the emissions impact of biomass, though the SAB panel has been struggling to provide advice in part because the proposed framework is policy neutral. Reflecting the divisions among labor and environmental groups, congressional Democrats have split on the issue. Some, like Sens. Elizabeth Warren (D-MA) and Ed Markey (D-MA), have urged the administration to delay a biomass policy until the science is settled. But others, including several top House Democrats, have backed EPA and industry.

McCabe Memo

Even before the SAB completed its review of the framework, EPA air chief Janet McCabe last year issued the controversial memo that said the agency would consider sustainably derived biomass to be a carbon-neutral compliance option for its ESPS -- though the memo did not define sustainable biomass.

The appropriations language appeared to codify the agency's effort -- and add definitions of sustainability. It was derived from a stand-alone bill offered by Sen. Angus King (I-ME) that says the EPA administrator "shall assume that forest biomass emissions do not increase overall carbon accumulations in the atmosphere if 1) a Forest Inventory and Analysis of the Department of Agriculture that is current at the time the action is taken shows that forest carbon stocks in the United States are stable or increasing; or (2) the forest biomass is derived from mill residuals, harvest residuals or forest management activities."

King's office also could not be reached for comment at press time, but one bioenergy source says the SAP "makes me wonder whether they even read the appropriations language because no one is claiming that biomass gets a categorical exemption as carbon neutral. . . . And that's why you have to look at issues around sustainability. . . . The [appropriations] language mimics what EPA said in November."

The SAP language is "completely weird. Someone needs to ask the White House what they're saying here," the source says. The source also has "no clue" as to how it got in the veto threat.

NAFO's Tenny stresses strong bipartisan support in both chambers of Congress for biomass energy's use as a carbon-neutral fuel source, as well as fairly consistent support from the administration "at least up to now" that there should be a clear and simple biomass policy on bioenergy as a "solution to some of our carbon challenges."

Terry adds that the SAP's criticism that the rider interferes with state renewable policies is off base because the language in the appropriations measures does not limit state authority but includes a savings clause that preserves existing state renewable policies.

Another industry source says the SAP language was "a bit strong and not completely expected" but suggests that doesn't mean the administration has made up its mind on biomass. Rather it shows the issue is "on the radar" and the administration is reminding people it is still in the process of reviewing it.

'Meaningful Distinctions'

But environmentalists are welcoming the SAP, saying it suggests that EPA may have to reverse course on the McCabe memo.

The second environmentalist says it is unclear where EPA is on the overall carbon neutrality issue but is hopeful that the SAP language suggests that the agency has heard the criticism and is refocusing. "It is very clear at this point that biomass cannot just be treated as carbon neutral even if it comes from sustainable forest management and even if forests are growing."

And the first source says, "I don't think the White House can articulate this position [in the SAP] which is sensible, and at the same time move forward with the McCabe memo. They're going to either have to abandon that part of the McCabe memo or interpret it in a way that has much more meaningful distinctions [on sustainability] than has previously been attributed."

This source says it is not yet clear whether it means that there is a split between EPA and the White House on the issue or if there's been "an evolution." The source adds it is "absolutely right" to look at the language in the SAP and "note how it contradicts the way that most people have read the . . . McCabe memo."

A third environmentalist notes, however, that the administration may be opposing the legislative language because it could be read as providing a broader waiver for biomass than what the McCabe memo does. The source says the language appears to count biomass as carbon neutral based on "any" forest management activity that could presumably include burning an entire forest.

Also, the bioenergy industry source and a fourth environmentalist suggest that EPA may have convinced the White

House to include the biomass language in the SAP over opposition to having the issue legislated, rather than having changed its mind on using a sustainability criteria for biomass carbon neutrality.

The SAP language could be “the White House and EPA . . . resisting having Congress dictate what is and what isn't carbon neutral,” the industry source says.

The environmentalist agrees, noting that the language could be “EPA rearing up on its hind legs” in opposition to having its biomass policy dictated by legislation.

Environmental groups this week sent a letter to White House regulatory reviewers urging that biomass be removed as an ESPS compliance option, writing that emission reductions attributed to biomass are “uncertain, speculative, and dislocated, and cannot be relied upon for the purpose of [ESPS] compliance.”

But NAFO's Tenny called the letter “not a surprise” and stressed the carbon benefits of biomass are “well-founded in science” and “clearly stated” by the Department of Agriculture. -- *Dawn Reeves* (dreeves@iwpnews.com)

David P. Tenny

President and CEO

National Alliance of Forest Owners

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Washington, D.C. 20001

Office: (202) 747-0739

Fax: (202) 824-0770

Cell: (703) 964-7519

dtenny@nafoalliance.org

www.nafoalliance.org

From: Noe, Paul
To: Goffman, Joseph
CC: Browne, Cynthia; Missimer, Katie; Tim_hunt@afandpa.org
Sent: 5/18/2015 12:59:40 PM
Subject: Environment Resource Committee Meeting Thurs 5/21, 2pm.
Attachments: KING carbon neutrality bill S1284.pdf; removed.txt; Topics for ERC Meeting 052115.docx

Dear Joe:

Thank you for your willingness to meet with our Environment Resource Committee this Thursday, 2pm-3pm at our offices at 1101 K Street, NW.

In anticipation of issues the members might raise with you, I am attaching: (1) a list of topics and key points, and (2) a copy of a carbon neutrality bill recently introduced by Senator King.

Do you have time to talk prior to Thursday's meeting? How is your calendar this Wednesday – say 2-3pm or after 5pm?

As a reminder, the entrance to our building is at the northeast corner of 12th & K, NW. You can take the elevators up to the 7th floor. We look forward to seeing you.

If you have any questions in the meanwhile, please feel free to call my cell (703) 909-2895.

Best regards,

Paul

Paul Noe

Vice President for Public Policy

Paul_Noel@afandpa.org

(202) 463-2777

AMERICAN FOREST & PAPER ASSOCIATION

1101 K Street, N.W., Suite 700

Washington, D.C. 20005



From: Emily McGlynn
To: Duke, Rick; Goffman, Joseph
CC: (b) (6); West, Tris; Cole, Jefferson; Irving, Bill
Sent: 4/8/2015 6:49:35 PM
Subject: Biomass co-firing in the Clean Power Plan

Dear Rick and Joe,

You might recall that we had meetings (one with CEQ, one with EPA) last fall to discuss the role of biomass co-firing in the Clean Power Plan. We know EPA is hard at work finalizing the rule while also managing the development of the Biogenic Accounting Framework. We have also seen Assistant Administrator McCabe's letter from November 19 2014. Based on numerous discussions with a variety of stakeholders on the potential role of biomass co-firing as a compliance strategy in the Clean Power Plan, we wanted to call this issue to your attention again for several reasons.

First, our understanding is the legal basis for regulating emissions from biomass combustion distinctly from fossil fuels has never been confirmed, nor has the technical approach for biomass emissions accounting. The DC Circuit Court of Appeals vacated EPA's 2011 attempt to defer regulation of biomass emissions until it could finalize a science-based approach, on process-related grounds, but left "for another day the question whether the agency has authority under the Clean Air Act to permanently exempt biogenic carbon dioxide sources..." We would suggest that, however EPA finalizes its decision-making on biomass eligibility with regards to the Clean Power Plan, it ensures strong legal footing under the Clean Air Act and avoids any related legal uncertainty for states, regulated entities, and the private sector. This legal analysis should be considered a political priority, not a technical detail.

Second, the McCabe letter helpfully answers some questions regarding how biomass will be handled under the Clean Power Plan but raises others. Key remaining questions include:

- Can biomass be used in coal plants, in addition to dedicated new build biopower?
- What kinds of biomass will qualify for waste, residue, and sustainably harvested categories?
- Will these categories be defined by EPA or will each state have discretion?
- Will these questions be answered imminently in order to inform state's planning processes, or only upon EPA's review of their plans?

When we talk about these issues with various stakeholders, getting clarity on these questions is a recurrent theme. States need to understand these issues so they can develop their implementation plans in good faith, and regulated facilities need to assess mitigation options.

We would note that biomass co-firing is likely the only significant cost-effective option for inside-the-fence measures available to coal-fired power plants other than efficiency improvements. Analysis by the Rocky Mountain Institute and The Earth Partners suggests that the technical potential for co-firing sustainable biomass categories like wastes, residues, and sustainable forest material could offset over one quarter of today's U.S. coal power consumption. Facilitating co-firing of sustainably-sourced biomass as a compliance option can provide an important off-ramp for utilities with significant coal fired assets, helping improve the political feasibility of 111(d) while bolstering degraded land restoration and other land management priorities in rural and agricultural communities.

We think prioritization and clarification of these issues with key stakeholders like states and regulated entities would be very helpful. My colleagues and I would like to share additional recommendations for how these issues can be handled that would be useful to discuss in a follow-up call or meeting.

Best regards,
Emily

--

Emily McGlynn | Manager | The Earth Partners
2 Bethesda Metro Ctr Ste 850, Bethesda MD 20814
(202) 487-8136
www.theearthpartners.com



From: Goffman, Joseph
To: Rick Duke
CC: Megan Ceronsky
Sent: 4/8/2015 6:56:25 PM
Subject: Fwd: Biomass co-firing in the Clean Power Plan
Attachments: image.png

Happy to deal with this on this end

- Joseph Goffman
 Sent from my iPhone

Begin forwarded message:

From: Emily McGlynn <emily.mcglynn@teplp.com>
Date: April 8, 2015 at 6:49:35 PM EDT
To: "Duke, Rick" <(b)(6) privacy>, <goffman.joseph@epa.gov>
Cc: (b)(6) >, "West, Tris" (b)(6) >, "Cole, Jefferson" <cole.jefferson@epa.gov>, "Irving, Bill" <irving.bill@epa.gov>
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Emily

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(202) 487-8136
www.theearthpartners.com

Inline image 1

From: Dave Tenny
To: Goffman, Joseph
CC: Browne, Cynthia
Sent: 2/10/2015 12:20:02 PM
Subject: Re: EESI Article

Thanks, Joe. Cynthia is already on top of the scheduling. We look forward to having you join us. Dave

Sent from my iPhone

On Feb 9, 2015, at 6:59 PM, Goffman, Joseph <Goffman.Joseph@epa.gov> wrote:

Thanks for sharing the article and extending the invitation. Would love to do it. Thanks, again.

From: Dave Tenny [<mailto:dtenny@nafoalliance.org>]
Sent: Monday, February 09, 2015 3:59 PM
To: Goffman, Joseph
Subject: EESI Article

Hi, Joe – you probably already saw this, but I thought I would forward it just the same. It strikes me as a pretty crisp rebuttal to the WRI Searchinger report.

How would you feel about coming to talk to our Operating Committee on March 3 or 4? I think it might do them and, perhaps, you some good to address the memo from last fall and shed some further light and understanding on the topic of “sustainably derived biomass.” As you might well imagine, it is still a pretty hot topic, and this would be an opportune time to address it. It could also possibly serve as a warm up for a CEO meeting with Gina in May.

Let me know if you are going to be around and if you would be interested. We would love to have you.

Thanks, Joe.

Dave

Report Based on False Assumption of Either-Or Land Use Approach

February 6, 2015

In the World Resources Institute (WRI) working paper, “Avoiding Bioenergy Competition for Food Crops and Land,” the authors work off the assumption that land-use decisions are used making an “either-or” approach, i.e., land can either be used to grow food – or biofuels crops. Land can either store carbon –or grow food and fiber. Land can either be devoted to wildlife habitat – or food and fiber production. The ‘either-or’ approach, while straight forward, lacks a basic understanding of the complexities of agricultural and working forest land use, emerging research on the carbon cycle in working lands, and the very real economic pressures on land owners to divert working lands to development.

The report, authored by Dr. Searchinger, a Senior Fellow at WRI and scholar at Princeton University, and WRI consultant Ralph Heimlich, leaves no sector of the biofuels economy untouched in their indictment of renewable fuels, as they have concerns about traditional starch based feedstocks (corn starch ethanol, beets, sugar cane), cellulosic feedstocks (such as purpose grown grasses and short-rotation

woody trees), and wood wastes (such as waste from pulp, paper and timber industries). Last week, SBFF promised readers that we would devote more time to understanding the assumptions and conclusions in WRI paper, and we address some of the main conclusions and assumptions employed in our discussion below.

The ‘Calorie Deficit’ Ignores Inequities Already Present in Food Systems

The basic premise of the report is that no productive land should be directed towards biofuels crops, due to the looming issue of a worldwide food shortage by 2050. This is despite the fact that food currently is over-produced, and worldwide, 50 percent of food is wasted. In the United States, EPA reports that food waste is the number one ingredient in landfills – imagine, every other bite of food is thrown away!

Therefore, growing ever more crops is not the answer to issues of individual and community equity in food politics. In fact, growing more and more food without addressing issues of food distribution, food waste (both in homes and across supply chains) will only exacerbate issues of environmental quality and do nothing to address affordable access to food.

Instead, EESI and others argue – the time is ripe for a dramatic shift in the food production and distribution system. Growing ever more food on large farms won’t address the environmental and food justice issues the world faces. Instead, integrated farms where food, fiber, fuels, feedstocks for chemicals and animal husbandry is practiced in sustainable ways is the food revolution that is so badly needed. More farmers, with more equity in the food production process is key to the solution. This includes diversifying crop production and providing alternative revenue streams for producers by growing feedstocks for biofuels and biobased products. In the United States, a flowering regional food system, farmers’ markets and growing recognition of the importance of family farms is a start – but more is needed to provide Americans and people everywhere equitable access to affordable, healthy food. As for Searchinger’s claim that food prices are affected by biofuels production, a World Bank analysis of the long-term drivers of food prices concluded that 66 percent of food price increases are thanks to oil prices. Additionally, only a small percentage of usable food crops goes towards biofuels production – globally, 2 percent of grain supplies go to ethanol production, according to the Global Renewable Fuels Alliance.

Biofuels Suffers from a Carbon Accounting Error, Ignores Years of Research

The WRI report continually implies that bioenergy’s potential is overblown due to a ‘carbon accounting error’. According to Dr. Searchinger, this double counting is a result of “assuming incorrectly that bioenergy can freely divert biomass or land that is already in use.” This same argument was raised by Dr. Searchinger in 2009, and since then, much research has been devoted to the topic.

Instead of forcing more land into production – research has actually found the opposite. Recent research from Dr. Bruce Babcock, an Iowa State University professor and a former California Air Resources Board consultant, finds that “the primary land use change response of the world’s farmers from 2004 to 2012 has been to use available land resources more efficiently rather than to expand the amount of land brought into production. This finding is not necessarily new ... however, this finding has not been recognized by regulators who calculate indirect land use.” And while drivers of land use change are complicated, and very different depending on a particular county’s forestry and land governance, the growing body of research encouragingly points to no net change in land use because of renewable fuels. This makes sense, since biofuels feedstocks fetch a lower value than food or feed products, their growth is not the number one driver of land-use decisions.

Additionally, the authors falsely conclude that there is an assumption that biofuels are ‘carbon free.’ Not

only does this ignore the complex science of carbon intensity calculations for all types of biofuels and biomass energy sources to identify the carbon footprint of biofuels, it assumes that crops devoted to biofuels growth are somehow removed from the carbon cycle. The science on land use change is constantly evolving, and new science is incorporated into updates to the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model developed by Argonne National Laboratory, which is the standard for comparing the carbon intensity of diverse fuels. Updates incorporated in more recent versions of GREET include significant reductions in the carbon intensity of ethanol production since 2008; these process improvements include greater energy efficiency, increasing yields per acre, and decreasing water and fertilizer inputs, among other things.

Paints a Picture of an Inefficient Industry – Ignores Years of Progress in Renewable Fuels

While Searchinger admits that other renewable technologies have seen great improvements in the last decade, he's unwilling to give biofuels a second look. That's despite the evidence of lower inputs and rising yields across the industry. Life-cycle assessment of both biofuels and traditional gasoline has found that while the carbon footprint of biofuels is dropping, it is steadily rising for traditional petroleum fuels. According to research from Dr. Steffen Mueller, Principal Economist at the University of Illinois at Chicago, Energy Resources Center, over the past 13 years, the amount of water necessary to produce one gallon of ethanol in factories has decreased from 5 gallons to 2.7 gallons of water. The amount of energy it takes to produce ethanol has also decreased from 1.09 kWh/gallon to 0.75 kWh/gallon, while crop yields have steadily increased. Many new technologies have contributed to these efficiency gains, with even greater gains emerging as new biorefineries use corn kernel fiber (previously a waste byproduct) to produce cellulosic ethanol.

According to scientists at Argonne, energy use for the production of corn-based ethanol dropped 25 percent, corn farming energy use has dropped 24 percent, and ethanol yields per bushel have risen three percent since 2008. Soil research also finds that soil organic carbon in corn fields has risen due to increased use of no till and conservation tilling practices. This is backed up by findings from the U.S. Department of Agriculture's (USDA) National Resource Conservation Service (NCRS), which also models soil carbon. According to the most recent GREET model, corn ethanol may already be achieving greenhouse gas reductions much higher than the 20 percent reduction mandated by the Renewable Fuel Standard (RFS). Yet, none of this newer information is considered by Searchinger.

Assumption that Other Renewable Technologies Will Save Us, Eventually

Using solar energy as an example, the authors state that "PV systems today can generate more than 100 times the usable energy per hectare than bioenergy is likely to produce in the future even using optimistic assumptions." While it is unclear how Dr. Searchinger calculated these numbers, the basic assumption is that we have time to wait for a perfect answer to our transportation needs. Currently, no country has the electric capacity, or the engine technology, to switch the entire vehicle fleet to plug-in electric. Most dangerously, Dr. Searchinger is content to wait for a future that's several years away, at best guess, and ignore the very real benefits of utilizing biofuels today.

In the end, the multiple co-benefits of biofuels are ignored by the WRI study, and a narrow, outdated view of biofuels production is taken instead. Sustainable biofuels production is possible. The production of biofuels and biofuels feedstocks will not only reduce GHGs and lower dependence on petroleum but provide immense benefit farmers and communities. Regionally appropriate biofuels feedstocks have the potential to revitalize agricultural practices, reduce the use of toxic gasoline additives, such as benzene, and enhance rural economic opportunity, thereby increasing rural welfare and economic security.

Instead of dismantling the biofuels industry, our attention should turn instead to making biofuels production and biofuels feedstock growth even more sustainable and equitable, not only to reduce GHG and other toxic emissions, but to assist rural communities keep working lands free of development, provide economic benefit to local communities, and continue to seek ways to feed the world and provide fuels sustainably. In the search for a low carbon economy, an “all of the above” approach needs to be taken towards renewable electricity and fuels generation. The U.S. and the world can’t afford to wait – sustainable biofuels are available now.

For more information see:

[Avoiding Bioenergy Competition for Food Crops and Land](#), The World Resources Institute

[Carbon Accounting and Vehicle Fuels: A Research Update](#), EESI

[State and Federal Regulators Continue to Use Outdated Emissions Model](#), EESI

David P. Tenny
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To: Dave Tenny
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According to scientists at Argonne, energy use for the production of corn-based ethanol dropped 25 percent, corn farming energy use has dropped 24 percent, and ethanol yields per bushel have risen three percent since 2008. Soil research also finds that soil organic carbon in corn fields has risen due to increased use of no till and conservation tilling practices. This is backed up by findings from the U.S. Department of Agriculture's (USDA) National Resource Conservation Service (NCRS), which also models soil carbon. According to the most recent GREET model, corn ethanol may already be achieving greenhouse gas reductions much higher than the 20 percent reduction mandated by the Renewable Fuel Standard (RFS). Yet, none of this newer information is considered by Searchinger.

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In the end, the multiple co-benefits of biofuels are ignored by the WRI study, and a narrow, outdated view of biofuels production is taken instead. Sustainable biofuels production is possible. The production of biofuels and biofuels feedstocks will not only reduce GHGs and lower dependence on petroleum but provide immense benefit farmers and communities. Regionally appropriate biofuels feedstocks have the potential to revitalize agricultural practices, reduce the use of toxic gasoline additives, such as benzene, and enhance rural economic opportunity, thereby increasing rural welfare and economic security.

Instead of dismantling the biofuels industry, our attention should turn instead to making biofuels production and biofuels feedstock growth even more sustainable and equitable, not only to reduce GHG and other toxic emissions, but to assist rural communities keep working lands free of development, provide economic benefit to local communities, and continue to seek ways to feed the world and provide fuels sustainably. In the search for a low carbon economy, an "all of the above" approach needs to be

taken towards renewable electricity and fuels generation. The U.S. and the world can't afford to wait – sustainable biofuels are available now.

For more information see:

[Avoiding Bioenergy Competition for Food Crops and Land](#), The World Resources Institute

[Carbon Accounting and Vehicle Fuels: A Research Update](#), EESI

[State and Federal Regulators Continue to Use Outdated Emissions Model](#), EESI

David P. Tenny
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dtenny@nafoalliance.org
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From: Dave Tenny
To: Goffman, Joseph
Sent: 2/9/2015 3:58:36 PM
Subject: EESI Article

Hi, Joe – you probably already saw this, but I thought I would forward it just the same. It strikes me as a pretty crisp rebuttal to the WRI Searchinger report.

How would you feel about coming to talk to our Operating Committee on March 3 or 4? I think it might do them and, perhaps, you some good to address the memo from last fall and shed some further light and understanding on the topic of “sustainably derived biomass.” As you might well imagine, it is still a pretty hot topic, and this would be an opportune time to address it. It could also possibly serve as a warm up for a CEO meeting with Gina in May.

Let me know if you are going to be around and if you would be interested. We would love to have you.

Thanks, Joe.

Dave

Report Based on False Assumption of Either-Or Land Use Approach

February 6, 2015

In the World Resources Institute (WRI) working paper, “Avoiding Bioenergy Competition for Food Crops and Land,” the authors work off the assumption that land-use decisions are used making an “either-or” approach, i.e., land can either be used to grow food – or biofuels crops. Land can either store carbon –or grow food and fiber. Land can either be devoted to wildlife habitat – or food and fiber production. The ‘either-or’ approach, while straight forward, lacks a basic understanding of the complexities of agricultural and working forest land use, emerging research on the carbon cycle in working lands, and the very real economic pressures on land owners to divert working lands to development.

The report, authored by Dr. Searchinger, a Senior Fellow at WRI and scholar at Princeton University, and WRI consultant Ralph Heimlich, leaves no sector of the biofuels economy untouched in their indictment of renewable fuels, as they have concerns about traditional starch based feedstocks (corn starch ethanol, beets, sugar cane), cellulosic feedstocks (such as purpose grown grasses and short-rotation woody trees), and wood wastes (such as waste from pulp, paper and timber industries). Last week, SBFF promised readers that we would devote more time to understanding the assumptions and conclusions in WRI paper, and we address some of the main conclusions and assumptions employed in our discussion below.

The ‘Calorie Deficit’ Ignores Inequities Already Present in Food Systems

The basic premise of the report is that no productive land should be directed towards biofuels crops, due to the looming issue of a worldwide food shortage by 2050. This is despite the fact that food currently is over-produced, and worldwide, 50 percent of food is wasted. In the United States, EPA reports that food waste is the number one ingredient in landfills – imagine, every other bite of food is thrown away! Therefore, growing ever more crops is not the answer to issues of individual and community equity in

food politics. In fact, growing more and more food without addressing issues of food distribution, food waste (both in homes and across supply chains) will only exacerbate issues of environmental quality and do nothing to address affordable access to food.

Instead, EESI and others argue – the time is ripe for a dramatic shift in the food production and distribution system. Growing ever more food on large farms won't address the environmental and food justice issues the world faces. Instead, integrated farms where food, fiber, fuels, feedstocks for chemicals and animal husbandry is practiced in sustainable ways is the food revolution that is so badly needed. More farmers, with more equity in the food production process is key to the solution. This includes diversifying crop production and providing alternative revenue streams for producers by growing feedstocks for biofuels and biobased products. In the United States, a flowering regional food system, farmers' markets and growing recognition of the importance of family farms is a start – but more is needed to provide Americans and people everywhere equitable access to affordable, healthy food. As for Searchinger's claim that food prices are affected by biofuels production, a World Bank analysis of the long-term drivers of food prices concluded that 66 percent of food price increases are thanks to oil prices. Additionally, only a small percentage of usable food crops goes towards biofuels production – globally, 2 percent of grain supplies go to ethanol production, according to the Global Renewable Fuels Alliance.

Biofuels Suffers from a Carbon Accounting Error, Ignores Years of Research

The WRI report continually implies that bioenergy's potential is overblown due to a 'carbon accounting error'. According to Dr. Searchinger, this double counting is a result of "assuming incorrectly that bioenergy can freely divert biomass or land that is already in use." This same argument was raised by Dr. Searchinger in 2009, and since then, much research has been devoted to the topic.

Instead of forcing more land into production – research has actually found the opposite. Recent research from Dr. Bruce Babcock, an Iowa State University professor and a former California Air Resources Board consultant, finds that "the primary land use change response of the world's farmers from 2004 to 2012 has been to use available land resources more efficiently rather than to expand the amount of land brought into production. This finding is not necessarily new ... however, this finding has not been recognized by regulators who calculate indirect land use." And while drivers of land use change are complicated, and very different depending on a particular county's forestry and land governance, the growing body of research encouragingly points to no net change in land use because of renewable fuels. This makes sense, since biofuels feedstocks fetch a lower value than food or feed products, their growth is not the number one driver of land-use decisions.

Additionally, the authors falsely conclude that there is an assumption that biofuels are 'carbon free.' Not only does this ignore the complex science of carbon intensity calculations for all types of biofuels and biomass energy sources to identify the carbon footprint of biofuels, it assumes that crops devoted to biofuels growth are somehow removed from the carbon cycle. The science on land use change is constantly evolving, and new science is incorporated into updates to the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model developed by Argonne National Laboratory, which is the standard for comparing the carbon intensity of diverse fuels. Updates incorporated in more recent versions of GREET include significant reductions in the carbon intensity of ethanol production since 2008; these process improvements include greater energy efficiency, increasing yields per acre, and decreasing water and fertilizer inputs, among other things.

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State and Federal Regulators Continue to Use Outdated Emissions Model, EESI

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From: Goffman, Joseph
To: Santiago, Juan
CC: Koerber, Mike; Kornylak, Vera S.; Gunning, Paul; Kocchi, Suzanne
Sent: 11/26/2014 12:31:17 PM
Subject: RE: Conversation with AF&PA on biomass memo

Really appreciate the note, Juan. Have a great holiday.

From: Santiago, Juan
Sent: Wednesday, November 26, 2014 12:16 PM
To: Goffman, Joseph
Cc: Koerber, Mike; Kornylak, Vera S.; Gunning, Paul; Kocchi, Suzanne
Subject: Conversation with AF&PA on biomass memo

Hi Joe,

Just wanted to give you a heads up the Vera and I talked with Paul Noe, Tim Hunt, and Linda Tsang yesterday at their request. The conversation was specific about the contents of the memo from Janet to the regions. In particular, they

(b) (5)



In any case, just wanted to let you know in case you get a call from them in the coming days looking for some more definitive answers than what I gave them

Thanks and have a great Thanksgiving!

Juan

From: Santiago, Juan
To: Goffman, Joseph
CC: Koerber, Mike; Kornylak, Vera S.; Gunning, Paul; Kocchi, Suzanne
Sent: 11/26/2014 12:15:35 PM
Subject: Conversation with AF&PA on biomass memo

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December 1, 2014

Ms. Gina McCarthy
 Administrator
 U.S. Environmental Protection Agency
 1200 Pennsylvania Avenue, N.W.
 Washington, D.C. 20460
 (Filed via regulations.gov)

Attention: Docket ID No. OAR-2013-0602
EPA's Proposed Clean Power Plan

Dear Administrator McCarthy:

The California Utilities¹ appreciate the opportunity to comment on the U.S. Environmental Protection Agency (EPA) proposal addressing CO₂ emission standards for existing fossil-fueled electric generating units (EGUs) under section 111(d) of the Clean Air Act (the "Proposed Rule," "Clean Power Plan" or "CPP").

¹ Pacific Gas & Electric Company, Southern California Edison, San Diego Gas & Electric Company, Southern California Gas Company, Los Angeles Department of Water and Power, Sacramento Municipal Utility District, Modesto Irrigation District, Turlock Irrigation District, and the members of the Southern California Public Power Authority, Northern California Power Agency, and the California Municipal Utilities Association, who together serve over 35 million (1 out of 9) Americans.

I. Introduction

California continues to be a regional and national leader in reducing greenhouse gas (GHG) emissions. In 2006, California enacted Assembly Bill (AB) 32 – a comprehensive and landmark law to reduce statewide GHG emissions to 1990 levels by 2020. Several initiatives directly affecting the power sector are in place to support the attainment of AB 32’s goal, including wide-ranging energy efficiency (EE) programs, a Renewables Portfolio Standard (RPS), and an Emission Performance Standard (EPS) for baseload generation. Another important example of California’s leadership is the state’s multi-sector GHG cap-and-trade program – the first of its kind in the United States. Launched in 2012, the cap-and-trade program puts a clear price on GHG emissions in the electricity, transportation and other sectors, thereby encouraging the transition toward lower-carbon energy sources.

California’s electric sector initiatives are working well. They have significantly reduced GHG emissions from both in-state electricity generation as well as imported power.² From 2000 to 2012, total GHG emissions from electricity generation decreased by 9 percent, in spite of the shutdown of the San Onofre Nuclear Generating Station (SONGS) and low hydropower generation due to an extended period of drought.³ Over the same time period, emissions from in-state electricity generation decreased by more than 13 percent.⁴ Concurrently, electricity consumption grew from 265.8 terawatt hours (TWh) in 2000 to 282.1 TWh in 2012, with a peak of 288.0 TWh in 2008, indicating a decline in the GHG intensity of the electricity used in California.⁵

California’s track record of climate leadership and robust experience implementing electric sector GHG reduction programs uniquely positions its electric utilities to comment upon the Proposed Rule. The California Utilities’ desired outcome is that the Proposed Rule balance the need to effectively reduce emissions while allowing utilities to continue to provide safe, affordable, and reliable electric service to customers. The California Utilities believe the best way to achieve this balance is to maintain the flexibility of the Proposed Rule, specifically, by adopting a final rule that affirms:

² California imports approximately 30 percent of its electricity from outside the state. Because these imports represent about 50 percent of California’s power sector GHG emissions, California’s emission reduction initiatives address both in-state and imported electricity.

³ California Air Resources Board, *First Update to the Climate Change Scoping Plan*. May 2014; http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf

⁴ Ibid.

⁵ Ibid. The GHG intensity of California’s electricity correlates strongly with the amount of hydropower used by the state, which was on average 13 percent of California’s electric power mix over the last twelve years. The GHG intensity of California electricity peaked in 2001 and reached a low point in 2011, a particularly wet year. In-state intensity has slightly increased in recent years due to the double impacts of the SONGS shutdown and low hydropower output caused by the drought.

- The approach to setting state goals based on assessment of emission reduction measures achievable by states going forward, which recognizes that opportunities for cost-effective emission reductions are not evenly distributed across states;
- The broad definition of the Best System of Emissions Reduction (BSER), which enables each state to utilize the Building Blocks and other measures to develop a unique plan to reduce emissions at lower cost;
- The ability to use existing state programs and measures, including market-based approaches such as emission budget trading programs, to demonstrate equivalency with the goals;
- The option for states to convert their rate-based goals to mass-based goals, which could facilitate participation in emission budget trading programs; and
- The potential to develop multi-state compliance plans, which presents opportunities for expansion of market-based emission reduction programs in the U.S. and linkages between them.

For the Proposed Rule to broaden participation and innovation in U.S. efforts to mitigate climate change, and to reflect California's unique position as an environmental leader and the largest load center in the western power market, the California Utilities provide the following five main recommendations.⁶ These recommendations focus on ways the EPA can support compliance with the Proposed Rule, given its complex structure.

The California Utilities recommend that the Proposed Rule be amended to:

- Improve the goal-setting assumptions and adjust the interim goals;
- Enable a broad range of GHG-reducing activities, beyond those used to establish the BSER, to count toward compliance;
- Maintain equivalent stringency and account for uncertainty when converting from a rate-based to a mass-based goal;
- Facilitate the development of multi-state compliance plans and/or agreements to reduce emissions at lower cost; and
- Enable state GHG reduction programs in compliance plans to continue to be enforced at the state level.

⁶ The recommendations set forth in these comments represent the collective opinion of the diverse group of publicly-owned and investor-owned utilities that comprise the California Utilities. Individual utilities may provide additional comments on various aspects of the Proposed Rule.

The California Utilities provide additional support for these recommendations in Section II below. These comments express the thoughts of the California Utilities at the time of signing; as additional or updated proposals are released by the EPA, we will endeavor to analyze those proposals and provide feedback in a timely and constructive manner.

II. Key Recommendations

A. Improve Goal-Setting Assumptions and Adjust Interim Goals

The California Utilities support the overall structure of establishing individual state goals by using the four Building Blocks proposed by the EPA. In particular, we support the inclusion of Building Blocks that involve investment in renewable energy generation and energy efficiency measures. Without these measures, obtaining the emission reductions envisioned by the Proposed Rule would be infeasible or prohibitively expensive with today's technology. The California Utilities are already in the process of reducing emissions via compliance with existing California policies that require high levels of renewable energy and energy efficiency. We believe that California's actions will be more successful at addressing global climate change if complemented by similar actions to reduce emissions across the country.

Nevertheless, the California Utilities have concerns about the reasonableness of the interim goals and about specific assumptions in Building Blocks 2 through 4. Therefore, as indicated below, we recommend that the EPA reconsider several of the assumptions used in goal-setting and adjust the interim goals. In addition, prior to finalizing the Proposed Rule, the EPA should verify the data upon which the goals are based.⁷

1. Building Block 2: Natural Gas Redispatch and Reasonableness of Interim Goals

As described in the Preamble, Building Block 2 consists of redispatch from higher-emitting coal and natural gas/oil steam units to natural gas combined cycle (NGCC) units to reduce overall CO₂ emissions.⁸ The EPA's calculation of the interim goals is based on an average of annual emission rate levels in the years 2020 -2029. However, the EPA assumes that coal plant efficiency improvements and redispatch of coal to NGCC units can be accomplished by 2020 – hence, additional emission rate reductions from these first two Building Blocks are

⁷ For example, the California Utilities are aware of cogeneration facilities that are included in the list of affected units that have useful thermal output that was not included in the data upon which the EPA based the California state goals.

⁸ US EPA, *Carbon Pollution Guidelines for Existing Power Plants: Emission Guidelines for Greenhouse Gas Emissions From Existing Stationary Sources: Electric Utility Generating Units* (hereafter referenced as the CPP), June 18, 2014, p. 34,862: <http://federalregister.gov/r/2060-AR33>

small or zero after 2020 in the EPA's methodology.⁹ The California Utilities are concerned that the timing of the proposed interim goals may potentially impair the reliability of the electric grid in certain regions. This concern is shared by the North American Electric Reliability Corporation (NERC) as documented in its "Potential Reliability Impacts of EPA's Proposed Clean Power Plan" report.¹⁰

Based on the Building Block 1 and 2 assumptions in the Proposed Rule, 75 percent of the overall expected emission rate reductions are expected by 2020. For some states, such as Arizona, where Building Blocks 1 and 2 play significant roles in goal-setting, interim goals are very close to final goals. Arizona, for example, would have to achieve over 90 percent of its expected emission rate reductions by 2020, and over 95 percent of its expected emission rate reductions before 2030 in order to meet its interim goal.¹¹

California's small amount of coal and oil/gas-fired steam generation results in only a slight increase in the utilization rate of existing NGCCs in the state when Building Block 2 is calculated.¹² However, since neighboring states such as Arizona are part of a western interconnected grid, and since California imports a significant amount of energy from these states, the California Utilities are concerned about the potential reliability impacts of such a significant implied shift in generation dispatch -- just six short years from now. While states have the flexibility to achieve the proposed goals without the full amount of redispatch assumed in goal-setting, the speed of the proposed redispatch by 2020 seems likely to require some changes that may affect reliability. In addition, such rapid changes in the electricity mix raise the potential for significant stranded costs, which may have energy cost implications for California ratepayers.¹³ The California Utilities agree with the NERC finding that a large amount of redispatch may be difficult for these states to execute due to inter- and intra-state transmission constraints, gas pipeline constraints, and other

⁹ CPP, p.34,863, and US EPA, *Goal Computation Technical Support Document (TSD)*, 2014: <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-goal-computation.pdf>

¹⁰ NERC, *Potential Reliability Impacts of EPA's Proposed Clean Power Plan*, November 2014: http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Potential_Reliability_Impacts_of_EP_A_Proposed_CPP_Final.pdf

¹¹ Percentage calculations based on numbers in EPA Excel spreadsheet 20140602-state-goal-data-computation_1.xlsx

¹² US EPA, *Proposed Emission Rate-Based CO₂ Goals and Illustrative Mass-Based Equivalents*, Nov. 6, 2014: <http://www.regulations.gov/contentStreamer?objectId=090000648191d190&disposition=attachment&contentType=excel12book>

¹³ As discussed herein, due to the interrelated nature of the electricity grid, it is impossible for states such as California to implement the Proposed Rule in a vacuum; compliance challenges and constraints faced by neighboring or regional partners will also have a profound impact on California and the California Utilities.

situation-specific factors, and could lead to reliability concerns that would affect California.¹⁴

The 2020-2029 averaging structure in the interim goal methodology does not provide any real relief from the front-loaded structure of the goal. If a state such as Arizona were prevented by reliability issues from redispatching away from coal by 2020 to the extent assumed by Building Block 2, its early 2020s emission levels would be higher than expected, and correspondingly, its late 2020s emission levels would have to be lower than expected to achieve the interim, averaged goal. This implies an unintended and potentially infeasible pathway of Arizona needing to reach emission levels well below its 2030 goal.

Even in California, where Building Block 2 plays a minor role in setting the state's goal, there are some specific constraints that may impact the performance of NGCC units. California is working towards meeting the most aggressive renewable portfolio standard in the country. The significant amount of additional intermittent renewable generation that the California Utilities are procuring could require NGCCs to cycle more often, and may affect their output and related emissions. Also, California contains several criteria pollutant non-attainment areas, such as the South Coast Air Basin. The EGUs located in the South Coast Air Basin are subject to South Coast Air Quality Management District's (SCAQMD) NO_x RECLAIM program, and SCAQMD is in the process of further reducing the NO_x emission credit allocations from affected sources. SCAQMD has proposed a 48.8 percent reduction in the allocations, but has not determined whether the reductions would occur across-the-board or not (e.g., on a sector basis).¹⁵ Depending on how the reductions are allocated, the capacity factors of EGUs in this area may be specifically limited. More generally, increasing NGCC generating capacity in the West could lead to conflicts with ozone attainment plans and unit-specific run-time limitations that are contained in NGCC permits. Therefore, the EPA should identify how to address these broader and state-specific constraints in developing and testing its assumptions about redispatch to NGCC, and revise Building Block 2 accordingly.

The California Utilities urge the EPA to work with states, regulatory authorities such as the NERC, and regional reliability organizations (RROs) such as the Western Electricity Coordinating Council (WECC) to adopt a more realistic view of the potential for redispatch that considers stranded costs and the reliability of the grid. Further, the California Utilities

¹⁴ NERC, *Potential Reliability Impacts of EPA's Proposed Clean Power Plan*, November 2014, p. 9-10: http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Potential_Reliability_Impacts_of_EPA_Proposed_CPP_Final.pdf

¹⁵ SCAQMD, *SCAQMD Presentation on NO_x RECLAIM*, NO_x RECLAIM Working Group Meeting, July 31, 2014: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/regxx/noxreclaim_wgm_073114_final.pdf?sfvrsn=2

request that the EPA assume a more reasonable, phased-in timetable for re-dispatch that would not threaten the reliability of the regional grid nor impose undue stranded costs on states' electric ratepayers. This revision should result in more realistic interim goals, which would not imply such sharp emission rate reductions by 2020, and which would provide the EPA and states a more measured way to gauge progress toward the 2030 goals.

The WECC has begun a phased study process to analyze potential impacts of the Proposed Rule to the western electric generation and transmission industry. Preliminary WECC results indicate that states' decisions made regarding compliance with the CPP can "drastically impact grid operations, system resiliency, and potentially, compliance opportunities for a neighboring state."¹⁶ The WECC has stated that its analyses will continue throughout 2015. The EPA should take advantage of such regional analyses to appropriately modify the interim goal structure.

i. The 2020 to 2029 Glide Path Proposals in the NODA

On October 28, 2014, the EPA posted a supplemental document that made additional information and ideas on the CPP available for public comment in a "Notice Of Data Availability" (NODA).¹⁷ The California Utilities appreciate the EPA's continued dialogue on CPP issues, and provide recommendations below in response to the requests for comment in the NODA.

With regard to the section in the NODA on "The 2020 to 2029 Glide Path," the California Utilities recognize that the up to 70 percent NGCC redispatch assumption used in Building Block 2 is a construct for goal-setting purposes, and does not imply that all states must reach such a level of redispatch in order to comply with the proposed goals. Nevertheless, the California Utilities urge the EPA to examine early action and phasing to reasonably adjust the interim goals, while maintaining the environmental integrity of the final targets.

Regarding the approaches to phasing-in Building Block 2 over the interim period that are mentioned in the NODA,¹⁸ the California Utilities support further investigation of whether additional infrastructure improvements are needed to support more use of existing natural gas-fired generation. The EPA should obtain a better understanding of infrastructure needs and reliability impacts by taking input from the states, NERC, and the RROs as noted above to identify a reasonable "glide path" for states to reach their final goals. The EPA

¹⁶ WECC, *EPA Clean Power Plan Phase I – Preliminary Technical Report*, September 19, 2014: [https://www.wecc.biz/Reliability/140912_EPA-111\(d\)_PhaseI_Tech-Final.pdf](https://www.wecc.biz/Reliability/140912_EPA-111(d)_PhaseI_Tech-Final.pdf)

¹⁷ US EPA, *Notice of Data Availability, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units*, October 28, 2014: <https://federalregister.gov/a/2014-25845>

¹⁸ US EPA, *Notice of Data Availability*, October 28, 2014, Section III.A: <http://www2.epa.gov/sites/production/files/2014-10/documents/20141028noda-clean-power-plan.pdf>

should then leverage this understanding to phase-in Building Block 2 from 2020 to 2029, assuming that the redispatch envisioned will take more time than the “by 2020” structure proposed in the CPP.

The California Utilities also support approaches to provide credit for early action to encourage emission reductions prior to 2030. As such, we support the EPA’s proposals for states to be able to: 1) apply toward their emission performance goal the emission reductions that existing state programs and measures achieve during the plan performance period as a result of actions taken after the baseline year of 2012, which we discuss further in Section II.B.1.i; 2) choose to implement state goal requirements early (i.e., before 2020), which could provide states with the ability to achieve the same amount of overall emission reductions, but to do so by making some reductions earlier; and 3) “credit” all existing (not just incremental) non-hydroelectric renewable generation.¹⁹

ii. The Building Block 2 Methodology in the NODA

With regard to the EPA’s proposals to 1) make Building Block 2 more stringent based on additional reductions that could be achieved through new NGCC units, 2) establish a minimum level of generation redispatch under Building Block 2, and 3) calculate Building Block 2 on a regional basis, the California Utilities recommend that the EPA coordinate with the RROs, such as WECC in the West, to further analyze these proposals. The purpose of this analysis would be to improve the understanding of the reliability impacts they may have, in order to identify a balanced and equitable “glide path” for states to reach their final goals. This analysis is important for states like California that have both significant NGCC capacity and few high emitting resources.

2. Building Block 3: Renewable Energy and Zero-Carbon Generation

Because California has no coal generation (aside from a small quantity embedded in certain CHP facilities) and limited re-dispatch opportunities for natural gas steam generation, the Proposed Rule’s goals for California are based primarily on Building Blocks 3 and 4. The California Utilities support the EPA’s proposed approach to Building Block 3, as long as the means by which the EPA addresses the asymmetric treatment of Building Block 3 resources between goal-setting and compliance do not increase the stringency of state goals or narrow compliance options. The California Utilities are concerned that potential changes to the Proposed Rule to address the asymmetric treatment of hydroelectric and nuclear generation could increase compliance risk if they elevate the importance of continued and

¹⁹ The California Utilities further support that the EPA credit RPS-eligible hydroelectric generation if the proposed approach to a RE target in Building Block 3 is pursued. See Section II.A.2.i.

sustained operation of all existing nuclear and hydroelectric resources without any remedy if these resources should cease operating or substantially reduce output in the future. We believe that existing nuclear and hydroelectric resources are extremely valuable zero-carbon resources that can play significant roles in supporting compliance in some states by avoiding the need for generation that would increase CO₂ emissions and make meeting state goals more difficult.

The California Utilities are also concerned about the alternative renewable energy (RE) approaches for Building Block 3 that are based on technical potential. As the EPA recognizes, “a metric based solely on technical potential has limitations” as data about technical potential does not factor in restrictions such as grid limitations,²⁰ costs associated with development, quality of resource, or reliability concerns. The myriad complexities and constraints associated with goal-setting based on technical potential make such an approach problematic, and should not be pursued.

i. Hydroelectric Generation

The EPA’s proposed RE approach for Building Block 3 involves a “best-practices” averaging of state-level RPS requirements on a regional basis, including California’s 33 percent RPS for the western region. California’s RPS allows certain types of hydroelectric resources (mostly small hydroelectric generation), hence, the Building Block 3 target is partially set based upon existing RPS-eligible hydroelectric resources.²¹ If the EPA pursues the proposed approach to establish Building Block 3 targets for RE, the California Utilities recommend that any existing RPS-eligible hydroelectric generation also count towards compliance, as further detailed in Section II.B.3.

If the EPA pursues the alternative RE approach for Building Block 3, which uses a state-by-state determination of RE targets based on technical and market potential,²² we recommend that the EPA remove existing hydroelectricity from the goal-setting calculation. As noted above, including existing hydroelectricity in this approach’s goal-setting methodology increases compliance risks, should hydroelectricity decline from baseline levels. This is of particular concern to California, given the ongoing drought and projected changes to the nature and timing of hydroelectric output in the future due to both regulatory changes²³ and climate change.²⁴ Nonetheless, the California Utilities recognize

²⁰ US EPA, *Alternative Renewable Energy Approach TSD*, 2014, p. 1-2: <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-alternative-renewable-energy-approach>

²¹ For example, in California, hydropower from small hydroelectric power plants 30 MW or less is RPS-eligible. See <http://www.cpuc.ca.gov/PUC/energy/Renewables/FAQs/01REandRPSeligibility.htm>

²² CPP, p. 34,869-34,870 and *Alternative Renewable Energy Approach TSD*

²³ For example, the Bay-Delta unimpaired flow proposal by the State Water Resources Control Board may significantly impact the nature and timing of hydroelectric output.

that existing hydroelectric resources are extremely valuable zero-carbon resources and should be recognized for the significant roles they play in supporting compliance. Therefore, should the alternative RE approach be pursued, the California Utilities recommend that it be structured such that existing hydroelectric generation is excluded from the goal-setting calculation.

ii. Approach to Renewable Energy Targets in the NODA

In the NODA, the EPA describes an approach to how states' RE targets could be set, whereby a regional RE target would be calculated by aggregating multi-state RE potential, which would then be reapportioned among individual states. While the California Utilities support being able to use out-of-state RE for compliance, we believe the appropriate way to address the parity issue this poses is to facilitate multi-state approaches to achieving the goals through the use of RE. Furthermore, the approach to RE target-setting described in the NODA is not necessary to ensure against double-counting of out-of-state RE. As discussed in Section II.B.2, there are regional tracking systems in place to account for the RE produced to support compliance with state goals.

The California Utilities find the NODA approach problematic because, as noted above, data about technical potential does not factor in many restrictions, which could lead to RE targets that may not be feasible to achieve. We are also concerned about the lack of detail on the reallocation criterion for apportioning target RE generation to states within a region. In the event the NODA approach is pursued, we urge the EPA to provide stakeholders the opportunity to comment on this issue; we also reiterate our recommendation to exclude hydroelectricity in setting state RE targets as it increases compliance risks, should hydroelectricity decline from baseline levels.

iii. Nuclear Generation

The California Utilities appreciate the EPA's recognition of nuclear power generation as a cost effective, zero-carbon resource in the Proposed Rule. As noted previously, we are concerned that potential changes to the Proposed Rule to address the issue of the asymmetric treatment of nuclear generation could increase compliance risks, as they elevate the importance of continued and sustained operation of existing nuclear resources

²⁴ California Climate Change Center. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California*, 2012: <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>. This report notes that by 2050:

- California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century.
- Some climate models show that the 30-year average precipitation in the San Diego region will decrease by more than 8 percent compared to historical totals, even under a lower emissions scenario.
- Springtime warming — a critical influence on snowmelt — will be particularly pronounced.

without any remedy if these resources should cease operating or substantially reduce output in the future. As such, the California Utilities support the EPA's proposal to include only a small amount of states' at-risk nuclear generation to establish state goals in order to limit downside risk if existing nuclear generation declines during the compliance period. We also support the EPA's proposal that generation from new and uprated nuclear plants count towards compliance with state goals.

iv. Approach to Applying Building Blocks 3 and 4 to State Goals in the NODA

In the NODA, the EPA requests comments about an approach to applying the CO₂ savings calculated in Building Blocks 3 and 4 to the eventual determination of state goals. In the Proposed Rule, the impacts from Building Blocks 3 and 4 are added to the denominator of the calculation establishing each state's goals, without commensurate reductions in the generation of the affected fossil EGUs (which is also included in that denominator). Some stakeholders suggested that the EPA should consider using the Building Block 3 and 4 impacts to reduce fossil EGU emissions and generation in the calculation, thereby creating significantly lower interim and final targets for each state.

The California Utilities have identified several concerns with the NODA proposal, and support the approach taken in the Proposed Rule, which the EPA expects to result in about a 30 percent reduction in CO₂ emissions from existing affected EGUs. The California Utilities believe that this level of emission reduction is an aggressive but reasonable target for 2030, and do not support significantly stricter emission performance levels. The proposal to use Building Block 3 and 4 impacts in the goal calculation to reduce expected generation from affected EGUs, along with the emissions from those units, is flawed because: 1) it "backs out" the generation from affected fossil EGUs by the generation from existing renewables twice, since the 2012 fossil EGU data already reflects the presence of 2012 levels of renewable generation; 2) it assumes that the system-wide efficiency and renewable investments contemplated are exclusively associated with reduced generation from the affected units, ignoring load growth and any generation in the remainder of the electricity system;²⁵ and 3) it would result in targets that are in some cases less than zero and that arguably cannot be met by feasible state compliance actions. Therefore, the California Utilities do not support the change to the state goal calculation described in the NODA.

v. Maintaining the 2012 Baseline Year

The California Utilities strongly support the use of 2012 as the baseline year. It is the most recent year of available data, and is most representative of California's existing EGUs due to

²⁵ In contrast to Building Blocks 1 and 2, which involve emission reductions at existing power plants, Building Blocks 3 and 4 result in system-wide emission reductions, not emission reductions at the units themselves.

the closure of SONGS in early 2012. The California Utilities also recognize that a 2012 baseline year may not be representative of other states' electricity portfolios. Therefore, we urge the EPA to set 2012 as the default baseline year, and provide states with the ability to either request an alternative baseline year or use a multi-year average (e.g., 2010-2012).

3. Building Block 4: Energy Efficiency

Building Block 4 consists of reducing demand for generation through policies to improve demand-side energy efficiency (EE), which results in CO₂ reductions.²⁶ The California Utilities strongly support including an EE contribution as an element of the BSER.

California and its electric utilities have a long history of implementing EE programs and believe, as the EPA acknowledges, that EE is a proven practice for reducing CO₂ emissions as well as customers' electric bills. California's aggressive work to reduce CO₂ emissions through EE has resulted in relatively flat per capita electricity consumption in the state over the last 30 years.²⁷

i. Energy Efficiency Savings Goal

The California Utilities consider the EPA's proposed EE savings scenario generally reasonable, if the savings from EE programs are calculated on a gross basis and the baseline²⁸ is properly defined and equitably applied across the utility sector. In addition, it will be necessary for all relevant state EE efforts, including codes and standards (C&S) as suggested by the EPA in the Proposed Rule, to be taken into account and measured in an equitable and cost-effective manner when determining compliance, as further detailed in Sections II.B.5 and II.B.6.

While the proposed 1.5 percent savings scenario is based on historic utility EE program results and targets, the EPA should recognize that state and national C&S are critical to achieving electricity savings across a state. This is particularly true in California, where C&S account for the majority of in-state annual energy savings, and where California's future efforts regarding C&S are expected to be aggressive. For example, California policymakers have established a policy requiring the construction of zero-net-energy new homes and buildings in the timeframe of the Proposed Rule, and are increasing efforts to

²⁶ CPP, p. 34,871

²⁷ California Energy Commission, *Integrated Energy Policy Report*, 2007.
<http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CMF.PDF>.

²⁸ Baseline refers to the measurements and facts describing facility operations and design during the baseline period. This will include energy use or demand and parameters of facility operation that govern energy use or demand. See CPUC, *California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals*, 2006, page 217.

target energy savings in existing buildings with appliance standards for building retrofits.²⁹ These goals will lead to an increase in savings from C&S in California, and a corresponding decrease in savings from utility programs. Therefore, it will be essential that the savings attributable to C&S are equitably counted towards California's EE savings during compliance; otherwise, a 1.5 percent goal for Building Block 4 is not realistic.

ii. Energy Efficiency Accounting for Net-Importing States

EPA calculates the BSER goal for a net-importing state by multiplying the total projected achievable EE savings by the percentage of in-state generation to total generation in 2012. For California, total EE savings are being devalued by approximately 30 percent before being applied to the BSER goal, as further detailed in Section II.B.5. The California Utilities believe that EPA should include 100 percent of California's modeled EE savings in the goal-setting process, and symmetrically include 100 percent of EE savings during compliance.

B. Enable a Broad Range of GHG-Reducing Activities, Beyond Those Used to Establish the BSER, to Count Toward Compliance

The California Utilities support the EPA's approach to providing states with broad flexibility to implement state CO₂ emission performance goals. We agree that states should be able to rely on existing and future programs to reduce emissions from affected EGUs within the state, which may include activities from within the four Building Blocks as well as other actions that reduce emissions. Notable examples of programs that California could use to reduce emissions include its Renewables Portfolio Standard program, various energy efficiency programs, and the price signal from the GHG cap-and-trade program as it applies to the electricity sector. We also agree that the Proposed Rule should encourage states to earn credit for emissions reductions achieved by existing programs and measures after the start of program in 2020, and recommend that the EPA examine feasible methods to provide states credit for reductions that occur prior to the start of the program while maintaining the stringency and environmental integrity of the EPA's 2030 goals.

1. Accounting for Existing State Programs and Measures

States should be able to apply toward their emission performance goal the emission reductions that existing state programs and measures achieve during the plan performance period as a result of actions taken after the baseline year of 2012. This approach would

²⁹ For the building codes proceeding, see: CEC Docket 12-BSTD-01: Rulemaking to adopt changes to the Building Energy Efficiency Standards contained in the California Code of Regulations (CCR), Title 24, Part 6 (also known as the California Energy Code). 2013 Building Energy Efficiency Standards, May 2012.

For appliance efficiency standards, see: Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601 through 1608), May 2013.

ensure that actions taken between the beginning of 2013 and the end of 2019 from state programs and measures can be recognized as contributing toward meeting a state's emission performance level for affected EGUs. This approach would reward states that have undertaken early action and encourage states to strengthen or begin emission reduction programs by 2020. A January 1, 2013 start date is also consistent with how most existing efficiency programs are measured and verified – on a calendar year basis. The complication of having two separate measurements of EE activities – one starting in January 2013 for existing state purposes and one starting in June 2014 for EE accounting in a state plan – is neither necessary nor desirable.

The California Utilities support the EPA's proposal to allow states to apply toward their required emission performance goal the emission reductions that occur during the plan performance period not only from the activities within the four Building Blocks, but also from other measures that reduce CO₂ emissions, such as emission budget trading programs, clean distributed energy resources, and modifications to existing resources (e.g., heat rate improvements at natural gas EGUs).

i. Crediting Early Action

In addition to the emission reductions the CPP will drive starting in 2020, the California Utilities support the recognition and encouragement of early emission reductions. The impacts of climate change are directly related to cumulative GHG emissions, so early investments to reduce CO₂ create important and long-lasting environmental benefits.

The EPA's assumptions in setting each state's emission rate goal include early state actions to reduce emissions prior to 2020, such as RE and EE measures. The EPA also proposes to consider the post-2019 impacts of most pre-2020 RE investment (which we believe should include RPS-eligible hydro investments) and of EE investments from mid-2014 onwards (which we believe should be adjusted to the beginning of 2013). The EPA also requests comment on whether emission reductions that existing state requirements, programs, and measures achieved prior to January 1, 2020 should be applied toward meeting the required levels of emission performance in a state plan. The California Utilities believe that reductions prior to 2020 should not be excluded from the compliance calculation, and support examination of feasible methods to credit such early actions that maintain the stringency and environmental integrity of the EPA's 2030 goals.

2. Accounting for Out-of-State Renewable Energy

The California Utilities support the EPA's proposal that, consistent with existing state RPS policies, a state may take into account all of the CO₂ emission reductions from RE measures implemented by the state, whether they occur in the state or other states. Under this

approach, the state that implements the measure claims the value for goal compliance regardless of where it occurs.³⁰

In demonstrating compliance, the California Utilities support the EPA's proposed structure to have RE that is developed in the regional electricity market, but outside the state in which a Renewable Energy Certificate (REC) is received, count toward compliance with the receiving state's plan.³¹ As the EPA has recognized, lower-cost RE is not evenly distributed throughout the country. States have recognized this and have credited out-of-state RE in meeting RPS requirements where there is a verifiable REC. Both existing and new RE should be recognized as long as there is a credible REC tracking system, as there is in the West in the Western Renewable Energy Generation Information System (WREGIS).³²

Inclusive of WREGIS, there are ten regional REC tracking systems that have the potential to cover each state in the U.S., along with all of Canada and Puerto Rico, and the U.S. Virgin Islands. These tracking systems are used to demonstrate compliance with many state RPS programs and can be adapted to enable states to count out-of-state RE towards their 111(d) goal in a way that prevents double-counting and ensures that the state that is paying for the RE receives the compliance credit for it under 111(d). While this issue could also be addressed with a multi-state plan or multi-state agreements, multi-state trading and tracking systems such as WREGIS are still needed to avoid double-counting. Therefore, the California Utilities recommend that the existing REC tracking systems throughout the country through which each REC may only be used or "retired" once be leveraged to provide the necessary safeguards.

3. Accounting for Hydropower

EPA's proposed RE approach to establishing Building Block 3 targets is based on an average of the RPS goals of the states within a region that have RPS goals. State RPS goals vary, but for the most part were established with the inclusion of certain hydropower resources as RPS-eligible resources.³³ However, EPA has proposed that only incremental hydropower may count towards compliance with state goals.³⁴ California entities' procurement decisions and compliance planning are long-term processes that include contracting with projects under long-term power purchase agreements based on current

³⁰ US EPA, *State Plan Considerations TSD*, 2014, p. 88: <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-state-plan-considerations.pdf>

³¹ CPP, p. 34,922

³² WREGIS is maintained by the Western Electric Coordinating Council (WECC)

³³ For example, in California, hydropower from small hydroelectric power plants 30 MW or less is RPS-eligible. See <http://www.cpuc.ca.gov/PUC/energy/Renewables/FAQs/01REandRPSeligibility.htm>

³⁴ CPP, p. 34,867

state law. Therefore, the California Utilities recommend that in addition to any incremental hydropower, existing RPS-eligible hydropower should also count towards compliance with state goals, in order to maintain consistency with the goal-setting process and state RPS programs.

4. Accounting for Bioenergy

State RPS goals were also largely established with the inclusion of bioenergy as an RPS-eligible resource.³⁵ However, the EPA has not yet definitively indicated whether or how different bioenergy resources will be considered carbon-neutral and eligible for compliance purposes. As such, we urge the EPA to finalize its biogenic CO₂ accounting framework prior to the finalization of the Clean Power Plan. Because bioenergy counts towards RPS compliance in California and most other states with RE targets, it should also count towards compliance with 111(d) in order to maintain consistency with state policy and long-term procurement commitments, in accordance with the final biogenic CO₂ accounting framework.

In addition to on-site bioenergy generation at landfills, digester gas facilities, and biomass plants, California's RPS includes biomethane co-firing at NGCC and other EGUs. At least eight of the EGUs included in the Proposed Rule in California are certified by the California Energy Commission as RPS-eligible using biomethane. California is currently developing new regulations to allow additional sources of biomethane within the state to be sent through the interstate pipeline system and designated for use in power plants.³⁶ Therefore, the EPA should explicitly account for the emission reduction benefits of biomethane co-firing in state compliance plans, per the final biogenic CO₂ accounting framework.

5. Accounting for Energy Efficiency Savings

The California Utilities support including 100 percent of the EE savings in the state, rather than the EPA proposal (similar to the goal-setting process) to devalue those savings by multiplying them by the in-state generation percentage (approximately 70 percent of

³⁵ For example, in California, RPS-eligible bioenergy include several types of biomass and biogas fuels. See <http://www.cpuc.ca.gov/PUC/energy/Renewables/FAQs/01REandRPSeligibility.htm>

³⁶ In response to Assembly Bill 1900 (Assemblyman Mike Gatto, chaptered into law on September 27, 2012 (Chapter 602, Statutes of 2012)), the CPUC is in the process of adopting policies and programs that promote the in-state production and distribution of biomethane and developing standards to protect human health and pipeline integrity and safety. In January 2014, the CPUC adopted Decision 14-01-034 establishing the monitoring and testing requirements for certain constituents of biomethane prior to pipeline injection. The CPUC is currently examining cost-allocation questions for these testing and monitoring requirements. See CPUC Rulemaking 13-02-008: Order Instituting Rulemaking to Adopt Biomethane Standards and Requirements, Pipeline Open Access Rules, and Related Enforcement Provisions, at: http://delaps1.cpuc.ca.gov/CPUCProceedingLookup/?p=401:56:12846601096790::NO:RP,57,RIR:P5_PROC EEDING_SELECT:R1302008

generation is currently in-state for California).³⁷ Neighboring exporting states would receive 100 percent of their in-state EE savings, but are not credited with any savings from California's EE investments in relation to their exported power. This results in about 30 percent of California's EE benefits not being credited to any state. Determining which EE savings displace generation inside and outside of California would entail complex modeling and an analysis of error and uncertainty; as such, it would be very difficult to determine where the reductions occurred.

The EPA's proposed approach to de-value CO₂ reductions resulting from EE for importing states would create perverse incentives. While RE would count 100 percent toward compliance, EE would only count a fraction of that, placing EE at a disadvantage compared to RE simply because of the EPA accounting method. While both new RE and new EE could be expected to have the same effect on dispatch of in- or out-of-state resources, the EPA's proposed method arbitrarily treats them differently by assuming RE would entirely offset in-state resources, whereas EE would offset in- and out-of-state resources. This approach would under-value EE in reducing CO₂ emissions for a net-importing state like California, and increase the overall costs associated with these measures.

Instead, the California Utilities believe that the EPA should use the same approach for EE and RE: the state that pays for the new resource (RE or EE programs) counts 100 percent of the new resource for compliance (an alternative raised at p. 34,922 of the Proposed Rule). This approach would give a clear signal to all states to utilize EE as the most cost-effective resource to reduce emissions by eliminating the Proposed Rule's cost-disadvantage bias against EE in net-importing states.³⁸ This eliminates the question raised by the EPA of what to do with the uncounted EE savings by counting it in the state that paid for it.³⁹ While the same outcome could be achieved through a multi-state plan or agreement, this approach could achieve the EPA's CO₂ reduction goals in a more simple and equitable fashion, should states choose to file individual compliance plans.

In addition, in response to the EPA's request for comments on the type of programs that should be eligible,⁴⁰ the California Utilities note that the EPA should not limit the types of EE measures that count towards EE savings to only "well-established programs."

³⁷ CPP, p. 34,922

³⁸ Maximizing cost effectiveness is also consistent with the energy resource loading order first adopted by California's principal energy agencies in 2003, which consists of decreasing electricity demand by increasing energy efficiency and demand response, and meeting new generation needs first with renewable and distributed generation resources, and second with clean fossil-fueled generation. See the 2003 *Energy Action Plan* prepared by the energy agencies and the CEC's 2003 *Integrated Energy Policy Report*.

³⁹ CPP, p. 34,897

⁴⁰ CPP, p. 34,921

California's experience has shown that as EE measures are implemented, they yield lower amounts of savings as the market is saturated; new measures are needed if the same rate of EE savings is to be maintained. For example, in recent years, behavioral EE programs have achieved substantial energy savings in California and will be a major factor in the state's ability to meet its goals. If EE is limited to a subset of existing and potential measures, it will not provide the incentives necessary to ensure that states continue to renew their EE portfolios and explore innovative EE programs that could produce sustainable energy savings over the long-term.

6. Accounting for Energy Efficiency Savings – EM&V

A rate-based emission performance goal will require specific evaluation, measurement and verification (EM&V) approaches to quantify the savings from EE. The EPA should have a common framework for measuring EE savings across states in place by 2017 to provide clear guidance regarding the EM&V methodologies to be used and the rigor of their implementation. The EPA acknowledges that despite “well-defined and generally accepted set of industry practices, many states with energy efficiency programs use different input values and assumptions in applying these practices (e.g., net versus gross savings, run-time of equipment, measure lifetime). This can result in significant differences in claimed energy savings values for similar energy efficiency measures between states and utilities.”⁴¹ Therefore, common and simple EM&V implementation guidelines and policies that provide a consistent level of rigor while allowing flexibility to customize EM&V approaches when needed will be essential to ensure that EE savings are reported consistently across states. Such guidelines will provide reassurance that EE can be relied upon to count towards rate-based goals as anticipated when states submit their plans.

California EE program administrators pursue a wide range of EE programs, on top of the codes and standards implemented in the state. Given that the EPA recognizes that EE programs are a proven way to reduce CO₂ emissions, the accounting of varying motivations of individual decision-makers participating in EE programs is superfluous, and the energy savings resulting from these programs should be counted on a gross basis.⁴² Counting savings on a gross basis promotes consistency with the goals of the Proposed Rule and supports measurement simplicity and uniformity of reported CO₂ reductions and energy savings among states. Differences in approaches to counting EE savings can result in drastically different net values. The best example of this is treatment of spillover,⁴³ which

⁴¹ CPP, p. 34,920

⁴² Gross savings are the change in energy use (MWh) and demand (MW) that results directly from program-related actions taken by program participants, regardless of why they participated in a program. See the State Considerations TSD, p. 52.

⁴³ Spillover refers to beneficial externalities of an EE program that generate additional EE savings.

can be equal to or greater than free-ridership,⁴⁴ and in some cases can result in administrators reporting net values that exceed gross values in aggregate. In addition, while some states expend considerable resources to determine net-to-gross⁴⁵ and spillover ratios, other states prefer to rely upon gross values. A review of the E Source DSM Insights database and some administrator annual reports reveal that Connecticut, Massachusetts, New York, Oklahoma, Pennsylvania, Washington, and Vermont all have portfolio level net savings that are close to or greater than gross savings.⁴⁶

To encourage simple measurement and ensure that there are not large disparities in reported CO₂ reductions and savings across states, energy savings should also be calculated using existing conditions as the measurement baseline,⁴⁷ rather than a counterfactual condition (one that may be subject to multiple interpretations due to baseline data and its availability). Using existing conditions to measure energy savings appropriately provides more benefit to those areas or technologies where the installed equipment is least efficient. This is consistent with the CO₂ reduction goals of the Proposed Rule. In addition, while some states currently expend considerable resources to create counterfactual baselines, others do not. A form of existing baseline is already used to measure EE savings in several areas including the Northeast EE Partnership, Colorado, Maine, New Jersey, and Michigan. Utilizing existing conditions to establish baselines will provide more consistency in implementation of the Proposed Rule across states.

The California Utilities recognize that EE savings estimates vary based on the unique weather and circumstances of each state, but general guidance from EPA on establishing EM&V protocols and implementation would be useful to provide national consistency and encourage increased adoption of EE programs by states.

EPA notes that “measure lifetime” is one area where many states may vary in input assumptions. Since a rate-based approach would take into account the cumulative annual savings of the total impacts of all EE measures put into place in that year and all prior years, equipment useful life (EUL) is a critical input to the calculation. Therefore, the California Utilities recommend that the EPA’s EM&V guidance establish appropriate EULs for different EE measures, rather than applying a generic linear decline in first-year savings over twenty years. Establishing appropriate EUL will provide the proper focus on longer-

⁴⁴ Free-ridership refers to program participation that would have occurred in the absence of the program.

⁴⁵ Net-to-gross is a ratio that accounts for only those EE gains that are attributed to, and the direct result of, the EE program in question. See <http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf>

⁴⁶ E Source, DSM Insights tool, MWh dashboard comparison of plan and actual values from 2009-2015; additional analysis of administrator annual reports also accessed through DSM Insights tool

⁴⁷ See baseline definition in footnote 28

lived, but potentially more expensive, measures to reduce emissions over the long-run, while simultaneously providing a consistent approach across states.

C. Maintain Equivalent Stringency and Account for Uncertainty when Converting from a Rate-Based to a Mass-Based Goal

The California Utilities contend that when converting a rate-based goal into a mass-based goal, the goal should remain as achievable in its mass-based form as it was in its rate-based form. From the analyses we have seen, there are a wide variety of approaches to converting to a mass-based goal, which yield a wide variety of results. Specifically, the Proposed Rule should create an equal degree of stringency between rate- and mass-based approaches when accounting for Building Blocks 3 and 4. In addition, we recommend that any mass-based goal conversion process account for key uncertainties with periodic updates of key factors, notably:

- The extent to which power sector emissions and emission rates may increase from the use of electricity as a transportation fuel;
- Economic and demographic growth through 2030; and
- The relative level of imported and exported power, which affects in-state emissions.

In the Preamble, the EPA states that it would allow a state to convert its rate-based goal to a mass-based goal.⁴⁸ The California Utilities strongly support the ability for states to convert to a mass-based goal. A mass-based goal may facilitate consistency with California's existing, multi-sector, mass-based GHG reduction program.

The EPA's TSD on "Projecting EGU CO₂ Emission Performance in State Plans" generally outlines an approach for converting each state's CO₂ emission rate goal into a CO₂ mass goal.⁴⁹ The EPA's new TSD, "Translation of the Clean Power Plan Emission Rate-Based CO₂ Goals to Mass-Based Equivalents," describes two other potential conversion approaches. The first approach in this TSD produces mass goals that apply to existing affected fossil sources only; the second approach produces mass goals that apply to existing affected and new fossil sources. The first approach does not assume any growth in generation occurs at existing units, which is an important omission for states like California, whose existing low average capacity factor NGCC units may be deployed more in the future. By failing to

⁴⁸ CPP, p. 34,897

⁴⁹ US EPA, *Projecting EGU CO₂ Emission Performance in State Plans TSD*, 2014, p. 45-46: <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-projecting-egu-co2emission-performance.pdf>

reflect potential growth in generation at existing NGCC units, this approach establishes mass goals that may not be equivalently stringent with rate goals. We recommend that the EPA modify the first approach to assign some of the potential increased generation associated with expected load growth to existing units for states such as California with relatively low NGCC capacity factors.

The EPA's second proposed approach includes a projection of future generation based on regional annual average growth rates from the EIA's 2013 Annual Energy Outlook (AEO). While this approach better captures some of the key exogenous factors, it does not address potential changes in the level of imports. The California Utilities suggest that the EPA explicitly address each of the key exogenous factors that will influence the mass goals, including economic growth, transportation electrification, and level of electricity imports and exports. Each of these factors will have a meaningful influence on expected mass emissions and so should be incorporated into the analysis used to convert from a rate goal to a mass goal in order to maintain equivalent stringency. For example, in California, and especially in the South Coast Air Basin, aggressive implementation of transportation electrification is a major strategy to meet federal criteria pollutant standards and Zero Emission Vehicle goals.⁵⁰ Such expected electrification should be incorporated into the analysis used to convert from a rate- to a mass-based goal. Further, as such exogenous drivers are highly uncertain over the timeframe of the Proposed Rule (i.e., 15+ years), the California Utilities suggest that the EPA clarify how and when states can revise their mass-based goals if expectations regarding key exogenous factors turn out to be meaningfully different. Such revisions can help ensure that equivalent stringency between rate- and mass-based goals is maintained, as intended, and make it easier for states to seriously consider opting for mass-based approaches by reducing some of the risk associated with mass-based goals.

D. Facilitate Development of Multi-State Compliance Plans to Reduce Emissions at Lower Cost

The California Utilities observe that a WECC-wide and market-based approach holds the most promise of achieving the EPA's expected emissions reductions at lower cost. Economic principles and EPA modeling suggest that a regional, market-based approach that enables the use of a full suite of power sector GHG abatement measures may achieve the EPA's emission reduction goals more cost-effectively than uncoordinated state-specific approaches. A multi-state plan, or aligned state plans where states address key issues in a

⁵⁰ State of California, *2013 Zero Emission Vehicle Action Plan*, 2013: [http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_\(02-13\).pdf](http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf)

similar manner through “modular agreements,” are preferred to address regional electricity market issues. To most cost-effectively achieve the EPA’s goals, the California Utilities actively support the development of a multi-state plan or agreements that ideally include all WECC states.

1. Facilitating Multi-State Coordination

The Proposed Rule requires each state to submit a plan that demonstrates that it will meet its interim and final goals. The EPA proposes that each state plan contain twelve components that would be required to be submitted within one year (with the possibility of a one- to two-year extension) after the EPA finalizes the CPP. The EPA is also allowing multiple states to join together such that the individual state goals in the CPP would be replaced with an equivalent multi-state goal.

The California Utilities are aware that the California Air Resources Board (ARB), in collaboration with the state’s energy agencies, has been actively reaching out to neighboring states to potentially develop multi-state agreements. As noted above, agreements with other states could be in the form of a comprehensive multi-state plan, or a series of “modular agreements.” A modular agreement would address certain Building Blocks or elements among states, allowing some collaboration if states are not able to obtain agreement on all elements required in a multi-state plan in the timeframe allowed. The California Utilities recommend that the EPA recognize and approve modular agreements in a state’s plan.

The California Utilities believe that there are advantages to developing multi-state plans (or modular agreements) because the interconnected electric grid crosses state borders, and because uncoordinated state-level compliance plans may negatively affect the dispatch of the electric system and result in reliability issues. These issues will take time to address in parallel with a state’s development of its state plan, or in the context of developing a multi-state plan. The California Utilities recommend that states be given the option to submit an individual state plan first within the EPA’s suggested timeframe, then be allowed additional time to submit a multi-state plan or modular agreements. This additional time (i.e., a two-year extension consistent with the EPA’s proposal for multi-state plans) to develop binding legal agreements and adopt state legislation will likely be necessary to implement a multi-state plan or modular agreements.

The EPA proposes that a state with an approved plan may revise its plan “provided that the revision does not result in reducing the required emission performance for affected EGUs specified in the original approved plan. In other words, no ‘backsliding’ on overall plan emission performance through a plan modification would be allowed.”⁵¹ However, as EPA

⁵¹ CPP, p. 34,917

recognizes, a multi-state approach would likely offer lower cost opportunities to achieving CO₂ reduction goals than a single state approach. Thus, the California Utilities recommend that EPA clarify that the “no backsliding” provision in the Proposed Rule does not apply to states that enter into a multi-state plan or modular agreement after submittal of an individual state plan as long as the states meet the multi-state plan requirements overall. In addition, given the different timelines that states may have in developing and implementing their plans, the California Utilities recommend that the final CPP include the ability for a state to join a multi-state plan or agreement after the compliance period start date.

i. Accounting for New Sources

The California Utilities support the EPA’s proposal that new sources may be included in a state’s compliance plan if the state so chooses. How these sources are treated is extremely important in states like California, whose interim and final emission rate goals are below that of a new NGCC. As such, we are concerned that absent a multi-state plan or regional agreement, different treatment of new sources by states in the same power market could result in negative market impacts, such as inefficient dispatch, economic distortions, and suboptimal siting of new NGCC facilities. We support further investigation into the impact of the treatment of new NGCC under different goal structures and compliance scenarios.

ii. Codification of Source Categories

The California Utilities support the EPA’s proposal to combine the two source categories for purposes of regulating CO₂ emissions in a new subpart UUUU. As the EPA implies in the Proposed Rule, such an approach may enable the development of a more flexible program for existing sources under Section 111(d) by facilitating implementation of CO₂ mitigation measures, such as shifting generation from higher to lower-carbon intensity generation among existing sources (e.g., shifting from boilers to NGCC units) or facilitating emissions trading among sources. Such flexibility should present opportunities for reducing the cost of achieving emission reductions under 111(d). For example, researchers at Resources for the Future have demonstrated that a given GHG abatement objective under 111(d) can be achieved at lower cost by looking across all fossil-fuel units for abatement rather than only at coal units.⁵²

⁵² See Burtraw, Dallas and Woerman, Matt, *Technology Flexibility and Stringency for Greenhouse Gas Regulations*. RFF Working Paper, July 2013.

E. Enable State Energy Programs in Compliance Plans to Continue to be Enforced at the State Level

The California Utilities agree with the EPA's proposal that would incorporate a state's emission reduction policies and regulations through a "state commitment" approach. Under this approach, the state requirements for entities other than affected EGUs would not be components of the state plan, and therefore would not be federally enforceable. Rather, the state plan would include a state-enforceable commitment to implement these requirements in order to achieve a specified portion of the required performance levels on behalf of affected EGUs.

Such an approach would be in line with California's current regulatory structure for GHGs, as it would allow states to rely on measures such as EE and RE programs, but not require the inclusion of those programs in the state plan. The state plan would include an enforceable commitment by the state itself to implement the state-enforceable (but not federally enforceable) measures that would help in achieving the state's CO₂ emission goals in the most efficient and effective manner.

California's commitment would be supported by extensive enforcement authority under existing state laws and regulations. First, California's GHG programs contain specific reporting requirements, reduction targets, and deadlines for these targets to be achieved. Second, California's regulatory agencies have broad authority to enforce these GHG reduction measures. For example, California law imposes significant criminal and civil penalties, as well as injunctive relief for violations of AB 32, its landmark GHG control law. In addition, California's RE standards require regulated entities to provide regular reports on compliance with RE requirements and requires regulatory agencies to enforce an entity's failure to comply. The California Public Utilities Commission oversees and enforces RE standards applicable to investor-owned utilities, and the California Energy Commission and the ARB enforce the RE requirements with regard to local publicly-owned utilities.

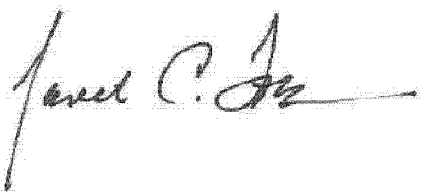
III. Conclusion

Reconciling existing California state policy with this new federal proposal is an important goal of the California Utilities, and the impetus for these comments. While the Proposed Rule is aimed only at the CO₂ emissions of existing power plants, the EPA should make every effort to ensure that this narrow scope does not complicate or hinder states taking a broader approach to GHG mitigation. Like California, many states are reducing GHGs beyond CO₂, from emitting sources beyond the electric sector, and from jurisdictions beyond their borders. The EPA should protect states that have taken this integrated approach from conflicting federal regulations by maintaining equivalent stringency and by accounting for uncertainty when converting from a rate-based to a mass-based goal.

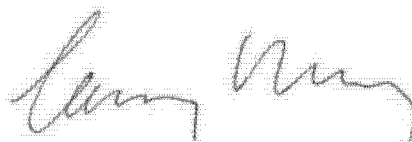
The California Utilities support the objective and general framework of the Proposed Rule, which at its core encourages states to reduce CO₂ emissions by implementing policies like those already in effect in California. However, the California Utilities have outlined a number of concerns that must be addressed if the proposal is to achieve its environmental goals, while still protecting safe, reliable and affordable electricity service.

The California Utilities thank the EPA for this opportunity to comment, and look forward to continuing the dialogue with EPA and our own state agencies in the coming months.

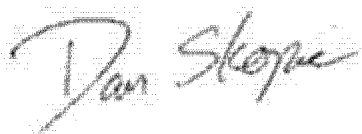
Sincerely,



Janet Loduca
*Vice President, Safety, Health, and
Environment*
Pacific Gas and Electric Company



Nancy Sutley
*Chief Sustainability and Economic
Development Officer*
Los Angeles Department of Water and
Power



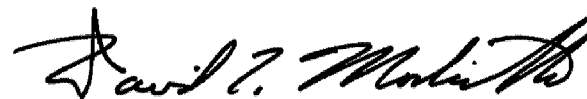
Dan Skopec
*Vice President, Regulatory and Legislative
Affairs*
San Diego Gas and Electric and Southern
California Gas Company



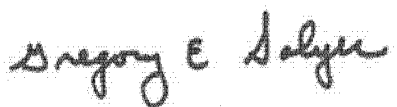
Michael Gianunzio
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Sacramento Municipal Utility District



Caroline Choi
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Environmental Affairs*
Southern California Edison



David L. Modisette
Executive Director
California Municipal Utilities Association



Greg Salyer
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Modesto Irrigation District



Bill Carnahan
Executive Director
Southern California Public Power
Authority



Jane Cirrincione
Assistant General Manager
Northern California Power Agency



Brian LaFollette
Assistant General Manager, Power Supply
Turlock Irrigation District

From: Dave Tenny
To: Goffman, Joseph
Sent: 9/10/2014 3:48:05 PM
Subject: Two items of potential interest
Attachments: Greenwire 9-9-2014 JOF Carbon Accounting Article.docx

Hi, Joe – I hope all is well.

I thought you might find the two attached items to be of interest. The first is the attached Greenwire story on the recently released Journal of Forestry article by Malmheimer, et. al. The second is a blog posting by me earlier today at the following link: <http://nafoalliance.org/media-room/nafo-blog/466-science-must-inform-not-set-epa-s-policy-for-a-carbon-accounting-framework>

Best,

Dave

David P. Tenny
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From: Goffman, Joseph
To: Joseph Goffman
Sent: 8/10/2014 6:43:58 PM
Subject: Fw: Letter to Podesta
Attachments: Biogenic Carbon Letter 8-7-14.pdf

From: Dave Tenny <dtenny@nafoalliance.org>
Sent: Thursday, August 7, 2014 1:23:28 PM
To: Goffman, Joseph
Subject: Letter to Podesta

Hi, Joe – I know you are out of the office, but I wanted to make sure you saw the attached letter to John Podesta on the carbon accounting framework. 25x25 lead the letter, but our folks were zealous to sign on so, not surprisingly, you will see a lot of them among the signatories.

Let's plan to get together soon after you get back. Hopefully you are getting a well-earned rest.

Thanks, Joe.

Dave

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From: Kathy Fallon Lambert
To: Goffman, Joseph
Sent: 5/28/2014 12:10:23 PM
Subject: Syracuse/Harvard Study on Carbon Standards and Clean Air
Attachments: Carbon cobenefits study FINAL SPE.pdf; FINAL Press Release_Co Benefits Study 5.27.pdf; Teleconference - FINAL-5-27-14.pdf

Dear Joe,

I thought you would be interested in receiving a copy of this new study. I've attached the press release, study, and slide deck.

If you have any questions or would like a briefing for EPA officials from the lead scientists, please don't hesitate to contact me.

Best regards,
Kathy

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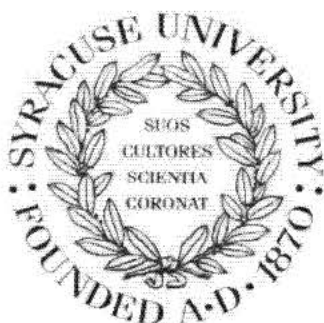
Kathy Fallon Lambert
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EMBARGOED UNTIL 5-27-14 at 9:01am ET

Co-benefits of Carbon Standards

Part 1: Air Pollution Changes under Different 111d Options for Existing Power Plants

May 27, 2014



HARVARD
SCHOOL OF PUBLIC HEALTH

Center for Health
and the Global Environment

Charles Driscoll, Syracuse University; Jonathan Buonocore, Harvard School of Public Health, Harvard University;
Habibollah Fakhraei, Syracuse University; Kathy Fallon Lambert, Harvard Forest,
Harvard University

EMBARGOED UNTIL 5-27-14 at 9:01am ET

Executive Summary

The U.S. Environmental Protection Agency (EPA) is slated to release the nation's first-ever carbon pollution standards for existing power plants on June 2, 2014. Carbon dioxide (CO₂) is one of most abundant greenhouse gases in the atmosphere and a major driver of human-accelerated global climate change. Fossil-fuel-fired power plants are the single largest source of anthropogenic CO₂ emissions in the U.S. They emit approximately 2.2 billion tons of carbon dioxide each year, representing 40 percent of total U.S. CO₂ emissions (USEPA 2014).

Carbon pollution standards that reduce CO₂ emissions from existing power plants can also cut emissions of other power plant pollutants that have negative human and environmental health impacts locally and regionally. These additional power plant pollutants (or, co-pollutants) include sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM) and mercury (Hg). Once emitted, SO₂ contributes to the formation of fine particle pollution (PM_{2.5}) and NO_x is a major precursor to ground-level ozone (O₃). For human health, these co-pollutants contribute to increased risk of premature death, heart attacks, increased incidence and severity of asthma, and other health effects (see Table 1). For ecosystems, these co-pollutants contribute to acid rain; the over-fertilization of many types of ecosystems, including grasslands, forests, lakes and coastal waters; ozone damage to trees and crops; and the accumulation of toxic mercury in fish (see Table 1). Therefore, policies intended to address climate change by reducing CO₂ emissions, that also decrease emissions of SO₂, NO_x, and primary PM_{2.5}, can have important human and environmental health co-benefits.

The study, led by Syracuse and Harvard universities, used existing estimates of energy sector emissions for a Reference Case and three alternative policy scenarios to quantify the amount and spatial distribution of resulting emissions, air quality, and atmospheric deposition of sulfur and nitrogen, and to a lesser extent of mercury by the year 2020. Each policy scenario reflects different carbon standards designs with varying stringency and flexibility. Given that the analysis was conducted prior to the introduction of the EPA rule, none of the three scenarios are likely to represent the exact standard proposed, but they bound a wide range of possible alternatives. From this analysis and ancillary supporting material, we draw the following conclusions (see *Summary of Results* on pages 24-26 for details):

1. Strong carbon pollution standards for existing power plants would decrease emissions of co-pollutants that contribute to local and regional air pollution by approximately 775,000 tons per year by 2020 compared to "business-as-usual" shown in the Reference Case.

2. The model results show that by decreasing the emission of co-pollutants, a strong carbon pollution standard would improve air quality and decrease the deposition of harmful pollutants. It is well-documented that the air pollution reductions estimated here have human health and ecosystem benefits.

3. The model results indicate that, with a strong carbon standard, air quality and atmospheric deposition improvements would be widespread with every state receiving some benefit. The greatest improvements are projected for states in and around the Ohio River Valley as well as the Rocky Mountain region.

4. Finally, the analysis suggests that the stronger the standards (in terms of both stringency and flexibility), the greater and more widespread the benefits associated with decreases in co-pollutants. It also shows that a weaker standard focused strictly on power plant retrofits could increase emissions and reduce air quality over large areas.

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U.S. Power Plant Pollution: Emissions, Transport, and Effects

Power plants are the single largest source of carbon dioxide (CO₂; 40%), sulfur dioxide (SO₂; 73%), and mercury emissions (Hg; 49%) in the U.S. (NEI 2011). They are also the second largest source of nitrogen oxide emissions (NO_x; 24%) (NEI 2011). Carbon pollution standards for existing power plants would not only help confront the challenge of global climate change, they would confer substantial local and regional benefits by reducing power plant emissions of these major co-pollutants by up to 27% for SO₂ and Hg and 22% for NO_x in 2020 compared to a Reference Case.

The 1990 Clean Air Act Amendments illustrate how public policy can facilitate cost-effective decreases in emissions of air pollutants. For example the SO₂ allowance trading program resulted in decreases in SO₂ emissions from electric power plants of 68 percent between 1990 and 2010, from 15.9 million short tons to 5.1 million short tons (NEI 2011) at approximately 15 percent the original cost estimate (Chan et al. 2012). Despite these cost-effective programs, current emissions and air pollution levels still pose considerable health and environmental challenges. In 2005, fine particulate matter (PM_{2.5}), largely from SO₂ and NO_x emissions, were attributed to between 130,000 and 320,000 of premature deaths, 180,000 non-fatal heart attacks, 200,000 hospital and emergency room visits, 2.5 million of asthma exacerbations, and 18 million lost days of work, and other public health effects (Fann et al. 2012). Ground-level ozone (O₃) was attributed to between 4,700 and 19,000 premature deaths, 77,000 hospital admissions and emergency room visits, and 11 million school absence days (Fann et al. 2012). In 2004, it was reported that over 100 million people in live in areas of the U.S. with ozone concentrations exceeding the 8-hour regulatory standard (USEPA 2004). In light of on-going concerns and mounting scientific research, EPA recently proposed to strengthen the National Ambient Air Quality Standards (NAAQS) for both fine particles and ground-level ozone.

In addition to health effects, elevated ozone can cause crop and forest damage, decades of acidic deposition have eroded the buffering capacity of soils leaving forests and watersheds more sensitive to continued inputs of sulfate and nitrate, and once mercury enters a watershed it persists for thousands of years where it bioaccumulates in food webs and contaminates wildlife and fish that people catch and consume. Moreover, sulfur deposition associated with acid rain can promote the conversion of mercury to methyl mercury, the form that most readily bioaccumulates in the environment. As a growth-limiting nutrient, elevated atmospheric nitrogen deposition can alter the structure and function of terrestrial and aquatic ecosystems.

In order to understand these widespread effects, it is important to characterize and quantify the linkages between power plant emissions, air quality, and the atmospheric deposition of pollutants. Once emitted from fossil-fuel fired power plants, SO₂ and NO_x react in the atmosphere to form sulfuric acid, nitric acid, and several secondary pollutants that have a cascade of health and environmental effects. Similarly mercury, after it is released to the atmosphere, can change chemical form and depending on its form be deposited in rain, snow, gaseous particles within kilometers from the source or circulate globally. The processes link emissions to air pollution and atmospheric deposition are briefly described below and are illustrated in Figure 1.

PM_{2.5} is fine particulate matter (PM) that can occur as primary PM that is emitted directly from a source or is formed in the atmosphere as secondary PM. Secondary PM is by far the largest fraction and is derived from precursor emissions such as sulfur dioxide (SO₂), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (NH₃). Secondary formation occurs through gas-phase photochemical reactions or through liquid phase reactions in clouds and fog droplets in the atmosphere generally downwind of the source. Most PM_{2.5} in

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rural areas is secondary. It is estimated that approximately half of the $PM_{2.5}$ in the eastern U.S. originates from sulfate associated with SO_2 emissions. Particle pollution forms the major component of haze in cities and in iconic landscapes such as national parks.

Tropospheric ozone is ground level ozone, a component of what is commonly referred to as “smog”. Ground-level ozone is not emitted directly into the air, it is formed in the atmosphere when anthropogenic emissions of NO_x combine with VOCs and react in the presence of sunlight. Peak O_3 concentrations generally occur in summer when higher temperatures and increased sunlight enhance O_3 formation (Knowlton et al. 2004). While elevated ground-level O_3 is primarily a concern in urban and suburban areas, ozone and the ozone precursors NO_x and VOCs can also be transported long distances by wind, causing high ozone levels in rural areas. Tropospheric ozone is also a greenhouse gas pollutant. Consequently, climate change mitigation measures that simultaneously reduce tropospheric ozone may generate additional climate benefits.

Acidic deposition is commonly referred to as “acid rain”. Acidic deposition is the transfer (deposition) of strong acids and acid-forming substances from the atmosphere to the surface of the Earth. Acidic deposition includes ions, gases, and particles derived from sulfur dioxide (SO_2), nitrogen oxides (NO_x), ammonia (NH_3) emissions, and particulate emissions of acidifying and neutralizing compounds. Acidic deposition can originate from air pollution that crosses state and even national boundaries, and affect large geographic areas (Driscoll et al. 2001b).

Mercury deposition results from mercury emissions to the atmosphere from direct anthropogenic sources, such as power plants, secondary sources that are re-emissions of primary sources, and natural emission sources. Emissions can occur as elemental Hg, gaseous ionic Hg (reactive gaseous mercury), and particulate Hg. These different chemical forms exert significant control over the fate of atmospheric Hg emissions and is the reason that Hg can be a local, regional, or global pollutant, depending on the speciation of the emissions and the associated residence times in the atmosphere. While Hg emission sources are common in more urbanized areas, deposition is also enhanced in forested areas where landscape conditions can lead to high rates of bioaccumulation. Therefore Hg deposition can be harmful in both urban and rural environments (Driscoll et al. 2007).

Nitrogen (N) deposition results from emissions of both inorganic and organic nitrogen. The primary forms of inorganic N emissions are nitrogen oxides (nitric oxide and nitrogen dioxide, referred to collectively as NO_x) and reduced N which includes ammonia (NH_3). Nitrogen oxides result from the partial oxidation of N_2 at high temperatures or from the release of N contained in fossil fuels during combustion. After it is emitted nitrogen can be transported hundreds of kilometers before it is deposited to Earth in precipitation (wet deposition) and as gases and particles (dry deposition) (Driscoll et al. 2003).

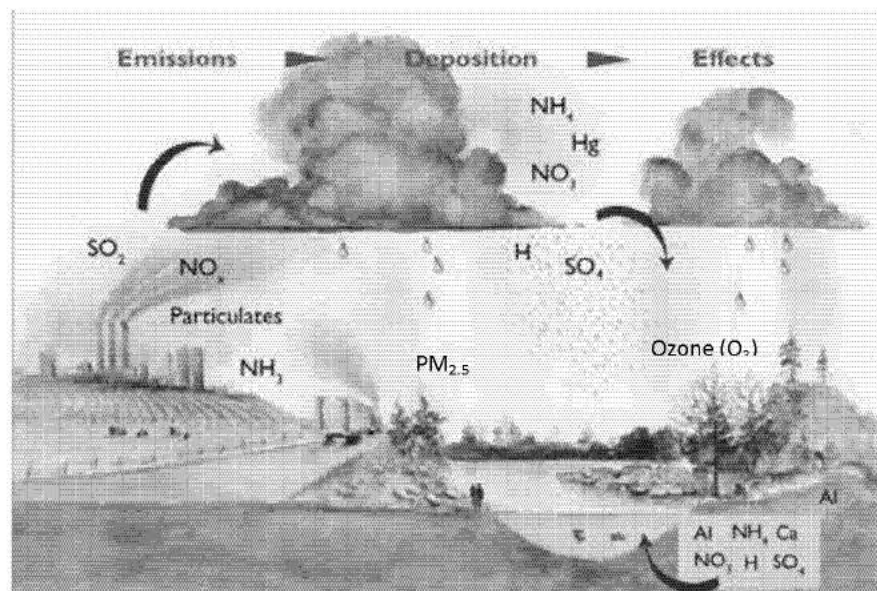


Figure 1: Linking emissions, air quality, deposition, and effects
Adapted from Driscoll et al. 2001a

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Effects on Human Health and Ecosystems

The co-pollutants emitted by power plants have demonstrated and well-understood health and environmental consequences. These adverse effects have been extensively documented and summarized in the peer-reviewed literature. We summarize the major impacts and supporting scientific evidence in the Table 1, below. While changes in air quality can result in nearly immediate improvements in human health, sensitive ecosystems that have been impacted by decades of elevated atmospheric deposition (acid, nitrogen, mercury) take decades or more to recover and remain a challenge today.

Table 1: Summary of air pollution effects from power plants.

Emissions	Pollutant	Effects	References
SO ₂	PM _{2.5}	<i>Human health:</i> Heart attack, chronic & acute bronchitis, lung cancer, asthma exacerbation, premature death	Pope et al. 1995, Woodruff et al. 1997, Pope et al. 2002, Cohen et al. 2004, Pope et al. 2004, Laden et al. 2006, Krewski et al. 2009, Pope et al. 2009, Cohen et al. 2010, USEPA 2011,
	Sulfur deposition (sulfate)	<i>Ecosystems:</i> Acidification of soils and surface waters, reduced tree health and productivity in sensitive areas, reduced fish abundance and diversity, increased methyl mercury production, diminished views	Cass 1979, Gorham 1989, Charles 1991, Baker et al. 1996, Likens et al. 1996, DeHayes et al. 1999, Driscoll et al. 2001, Driscoll et al. 2010, Greaver et al. 2012
NO _x	Ground-level ozone (NO _x emissions are a precursor to ozone formation)	<i>Human health:</i> Difficulty breathing, coughing and sore throat, asthma exacerbation, emphysema, chronic bronchitis, increased infection risk, pre-mature death <i>Ecosystems:</i> Reduced tree health and forest productivity, reduced crop productivity, reduced visibility	Gong et al. 1986, Ostro and Rothschild 1989, Schwartz 1994, Schwartz 1995, Chen et al. 2000, Burnett et al. 2001, Gilliland et al. 2001, Jaffe et al. 2003, Bell et al. 2004, Gryparis et al. 2004, Karlsson et al. 2004, Huang et al. 2005, Ito et al. 2005, Levy et al. 2005, Peel et al. 2005, Schwartz 2005, Wilson et al. 2005, USEPA 2007, Jerrett et al. 2009, Larsen et al. 2010, Mills et al. 2011
	Nitrogen deposition (reactive N)	<i>Ecosystems:</i> Over-enrichment of ecosystems, increased production and changes in species	Valiela 1997, Bricker et al. 1999, Valiela et al. 2000, Fenn et al. 2003, Galloway et al. 2003, Pardo et al. 2011
	Nitrogen deposition (nitrate)	<i>Ecosystems:</i> Acidification of soils and streams, reduced tree health and productivity in sensitive areas, reduced fish abundance/ diversity	Aber et al. 1995, Baker et al. 1996, Magill et al. 1997, Driscoll et al. 2001, Aber et al. 2003
Mercury	Mercury deposition and bioaccumulation	<i>Human health:</i> Reduced IQ, memory deficits, reduced visual-spatial function, increased risk of heart disease <i>Ecosystems:</i> Fish & wildlife: decreased reproductive success, increased embryo/chick mortality, altered schooling/ flying/ walking, acute toxicity	Aulerich et al. 1974, Scheuhammer 1988, Salonen et al. 1995, Wiener and Spry 1996, Nocera and Taylor 1998, Guallar et al. 2002, NRC 2002, CDC 2004, Mahaffey et al. 2004, Trasande et al. 2005, Driscoll et al. 2007, Evers et al. 2007, Swain et al. 2007, Roman et al. 2011, USEPA 2011

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111d Co-benefits Analysis: Policy Context and Approach

Policy Context

At the direction of a 2013 Presidential memo, the U.S. EPA is using its authority under section 111(d) of the Clean Air Act to issue standards that address carbon pollution from existing power plants. The Presidential memo to EPA states: “I direct you to use your authority under sections 111(b) and 111(d) of the Clean Air Act to issue standards, regulations, or guidelines, as appropriate, that address carbon pollution from modified, reconstructed, and existing power plants...” (White House 2014). Section 111(d) is a state-based program that is based on federal standard, or “emission guideline” (USEPA 2014a). The intent is for EPA to establish a federal standard and for states to design programs that fit the guidelines and achieve the necessary carbon dioxide reductions.

Scope and Approach

A team of scientists is collaborating to conduct the first integrated, spatially explicit study for the entire lower 48 U.S. states of the benefits to health and ecosystem services associated with different approaches to carbon pollution standards for existing power plants. The study: (1) highlights the fact that power plants emit many harmful and interacting pollutants that degrade air quality; (2) illustrates the linkages between atmospheric pollution, and human and ecosystem health; and (3) shows how a strong carbon pollution standard has local, to regional, to global benefits compared to alternatives. The study is being undertaken in three parts (Figure 2). Part 1 results are summarized in this report (Figure 2).

In this study existing estimates of power plant emissions are used for the Reference Case and three scenarios for the year 2020 to quantify associated changes in air quality (ozone and PM_{2.5}) and atmospheric deposition of pollutants (sulfur, nitrogen, and mercury) using the Community Multiscale Air Quality (CMAQ) Model.

In Part 2 detailed air quality results will be used to quantify and compare the changes in health impacts across the U.S. from the different policy scenarios using the Benefits Mapping and Analysis Program (BenMAP), published by EPA. *We anticipate these results will be available in late July, 2014.*

In Part 3 air quality and atmospheric deposition results will be used to estimate environmental benefits and changes in ecosystem services using various models. This is likely to include recovery of streams and forests from acid rain, reduced ozone damage to crops and timber, and improved visibility in focal landscapes. *We anticipate these results and a full report on the three parts will be released in September, 2014.*

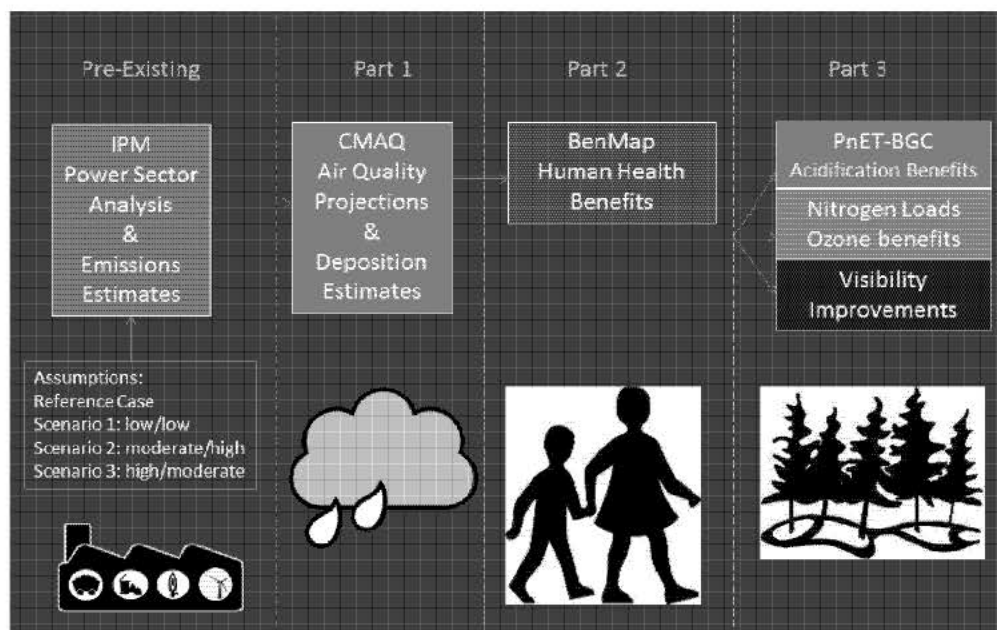


Figure 2: Diagram of co-benefits of carbon standards study.

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In Part 1, parsed unit-level emissions output from the Integrated Planning Model (IPM) produced by the consulting firm ICF International were used as input to CMAQ. CMAQ was developed by the U.S. EPA and is used by EPA, states and other groups to conduct Regulatory Impact Assessments (RIA) and State Implementation Plans (SIPs), respectively (USEPA 2014b), along with other applications. In this study CMAQ v.4.7.1 (the most currently widely available version) was used, based on EPA's 2007/2020 modeling platform and year 2007 meteorology from v.3.1 of the Weather Research and Forecast (WRF) model. The CMAQ model produces gridded air quality concentrations and deposition rates for the entire lower 48 states of the U.S. on a 12-km CONUS domain. Changes in atmospheric concentrations and deposition are projected by simulating emissions, advection, diffusion, chemistry, and deposition for multiple pollutants and pollutant forms.

Carbon Pollution Standards: Reference Case & Policy Scenarios

To project changes associated with policy options, the CMAQ model requires detailed emissions information from power sector models for a future year in order to simulate changes in air quality and atmospheric deposition. Output from EPA's Integrated Planning Model (IPM; US EPA 2014c) is often used to run CMAQ. Given the focus of this study is to characterize and quantify changes in co-pollutants and the consequences for human health and ecosystems, IPM results from other studies were used as policy scenarios. IPM results for a Reference Case and three alternatives were acquired from the firm ICF International. The reference case is largely based on the Energy Information Administration's Annual Energy Outlook 2013. The IPM policy runs include two scenarios commissioned by the Bipartisan Policy Center (BPC) and one commissioned by the Natural Resources Defense Council (NRDC), representing a range of policy options.

The three policy scenarios and associated IPM runs were selected from among a suite of alternatives independently developed by either BPC or NRDC. The three scenarios selected represent different stringencies (represented in these scenarios as an emissions rate in tons of CO₂/MWh) and flexibility (represented by options available for compliance and extent to trading or averaging is allowed). The scenarios therefore bound a range of possible options available for controlling CO₂ emissions from power plants and offer insights for understanding and quantifying the consequences for co-pollutants. The scenarios were selected as researchable alternatives and do not represent preferences of the authors of this report. Importantly, none of the options include a strict "mass-based" standard or carbon budget in tons of CO₂/year which has been proposed by other groups (see Phillips 2014). However, a mass-based alternative would be a useful scenario to analyze in future studies but IPM results for this alternative were not available at the time of this analysis. Moreover, it has been pointed out that EPA or the states can convert rate-based standards to a mass-based standard by using projected generation levels and the performance standard to calculate CO₂ emissions budget for each state (Burtraw 2013).

Scenario Descriptions

The assumptions for the Reference Case and three scenarios are described briefly here and are depicted in Figure 3. More information on the Reference Case and Scenario #2 can be found at: <http://www.nrdc.org/air/pollution-standards/>.

Reference Case was developed jointly by BPC and NRDC. It is benchmarked to the Energy Information Administration's Annual Energy Outlook of 2013, which projects lower electrical demand and, thus, lower CO₂

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emissions compared to 2012. It also assumes full implementation of the current clean air policies adopted by EPA (see Figure 3).




Scenario #1 (Low/Low) is referred to as the “Unit Retrofit” scenario by BPC. Scenario #1 is equivalent to an emissions rate-based standard that uses improvements in heat rates at existing coal-fired power plants to comply with the carbon standard. It could be described as a *low* stringency alternative with *low* flexibility limited to changes that can be made “inside the fence” of individual power plants. Heat rate (Btu/kWh) is a measure of power plant efficiency. This scenario is based on the idea that a more efficient power plant will burn less fuel for the electricity it produces and will therefore emit less CO₂ per MW. The scenario uses “best-in-class” heat rates for different coal plant categories based on the unit’s capacity, fuel type, steam cycle, and boiler type. Coal-fired power plants then have to achieve an emission rate equivalent to what would be achieved if they closed the gap between its unit-specific heat rate and the best in class heat rate by 40 percent. Under this scenario, the fleet-wide average heat rate would improve 4 percent. This scenario results in a national average emissions rate of 2000 lbs/MWh for coal and 1000 lbs/MWh for gas; only a modest decrease from current emissions rates.

Scenario #2 (Moderate/High) is referred to as the “Moderate Full-Efficiency” scenario in Lashof and Yeh (2014). Scenario #2 is based on a flexible system-wide approach that achieves CO₂ emissions reductions through a state-specific rate-based performance standard for existing power plants. It is a *moderate* stringency scenario with *high* compliance flexibility. For 2020, the national emission rate targets are 1,500 lbs/MWh for coal and 1,000 lbs/MWh for gas. This scenario allows additional renewable energy and energy efficiency to count toward compliance. It also allows emissions averaging across all fossil units in a state and states may opt-in to interstate averaging or credit trading. The scenario assumes energy efficiency is available at a total resource cost of 4.2 – 5.8 cents/kWh (Lashof 2013, Lashof and Yeh 2014). Though details are not specified, this scenario allows states to develop alternative plans, including mass-based standards, provided they achieve equivalent emission reductions (Lashof 2013). More information on the assumptions for Scenario #2 can be found in the technical appendices at: <http://www.nrdc.org/air/pollution-standards/>.

Scenario #3 (High/Moderate) is referred to as the “A4” scenario by BPC. It requires supply-side electric sector CO₂ reductions that can be implemented up to a cost of \$43 per metric ton in 2020. In that way, it is modeled to reflect what might happen if there was a national tax on CO₂ emissions from power plants that is the same as (and increases with) the estimated social cost of carbon (Interagency Working Group 2013). It is a *high* stringency scenario with *moderate* compliance flexibility. In 2020, it results in average national emission rates of 1200 lbs/MWh for coal-fired power plants and 850 lbs/MWh for gas. The compliance options that are implemented are limited to changes up to the specified cost per ton and include on-site heat rate improvements, co-firing or converting to lower emitting fuel (i.e., natural gas or biomass), or shifting generation dispatch (the order in which power plants are called to operate in response to changing electricity demand) to favor lower carbon emitting electrical generation sources. However, demand-side energy efficiency is not included as a means of reducing emissions for this preliminary modeling scenario (Macedonia 2014).

Figure 3: Reference Case and scenario assumptions.

<i>Reference Case</i>	
Policy Assumptions:	
<ul style="list-style-type: none"> All current air quality policies fully implemented No carbon pollution standards 	
Included:	
<ul style="list-style-type: none"> EIA 2013 Annual Energy Outlook determines energy demand Mercury and Air Toxics Standards (MATS) implemented Clean Air Interstate Rule implemented, including Phase II in 2015 Regional Greenhouse Gas Initiative (RGGI) model rule for emissions trading included (w/out NJ) CA Assembly Bill 32 (AB32) included Regional haze rule included Wind power production tax credit (PTC) expires Onshore wind costs: DOE/LBL 2012 Wind Technologies Report Nuclear units re-licensed, 20-year extension 	

<i>111d Scenarios</i>			
Policy assumptions:			
<ul style="list-style-type: none"> All current air quality policies fully implemented as in the Reference Case Carbon pollution standards adopted under section 111d for existing power plants 			
<i>Scenario 1: Low/Low</i>	<i>Scenario 2: Moderate/High</i>	<i>Scenario 3: High/Moderate</i>	
			
<i>Low stringency, low flexibility and energy efficiency</i>	<i>Moderate stringency, high flexibility and energy efficiency</i>	<i>High stringency, moderate flexibility and energy efficiency</i>	
Stringency estimate: 2000 lbs/MWh coal; 1000 lbs/MWh gas	Stringency benchmark: 1500 lbs/MWh coal; 1000 lbs/MWh gas	Stringency estimate: 1200 lbs/MWh – coal; 850 lbs/MWh	
Compliance options: <ul style="list-style-type: none"> Limited to on-site carbon emission rate reductions Power plant efficiency/heat rate upgrades Modest natural gas & biomass co-firing 	Compliance options: <ul style="list-style-type: none"> Power plant efficiency/heat rate upgrades Co-firing with lower-carbon fuels Dispatch changes to lower-carbon generation sources State/interstate averaging and trading 	Compliance options: <ul style="list-style-type: none"> Power plant efficiency/heat rate upgrades Co-firing with lower-carbon fuels Dispatch changes to lower-carbon generation sources 	
Energy efficiency: <ul style="list-style-type: none"> Only efficiency measures at the power plant included 	Energy efficiency: <ul style="list-style-type: none"> Full supply-side and demand-side (end-user) energy efficiency included. 	Energy efficiency: <ul style="list-style-type: none"> Supply-side efficiency (power plant and transmission lines). 	

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Figure 4a: Power generation by scenario (terawatt/hours).

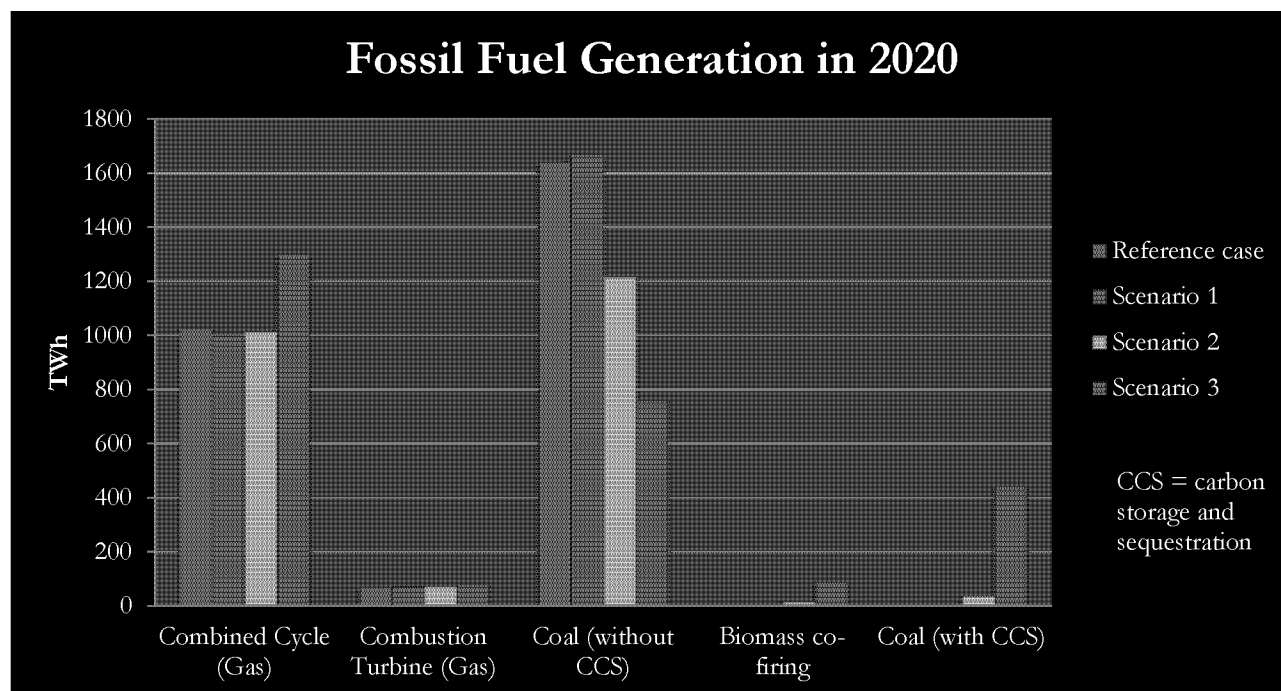
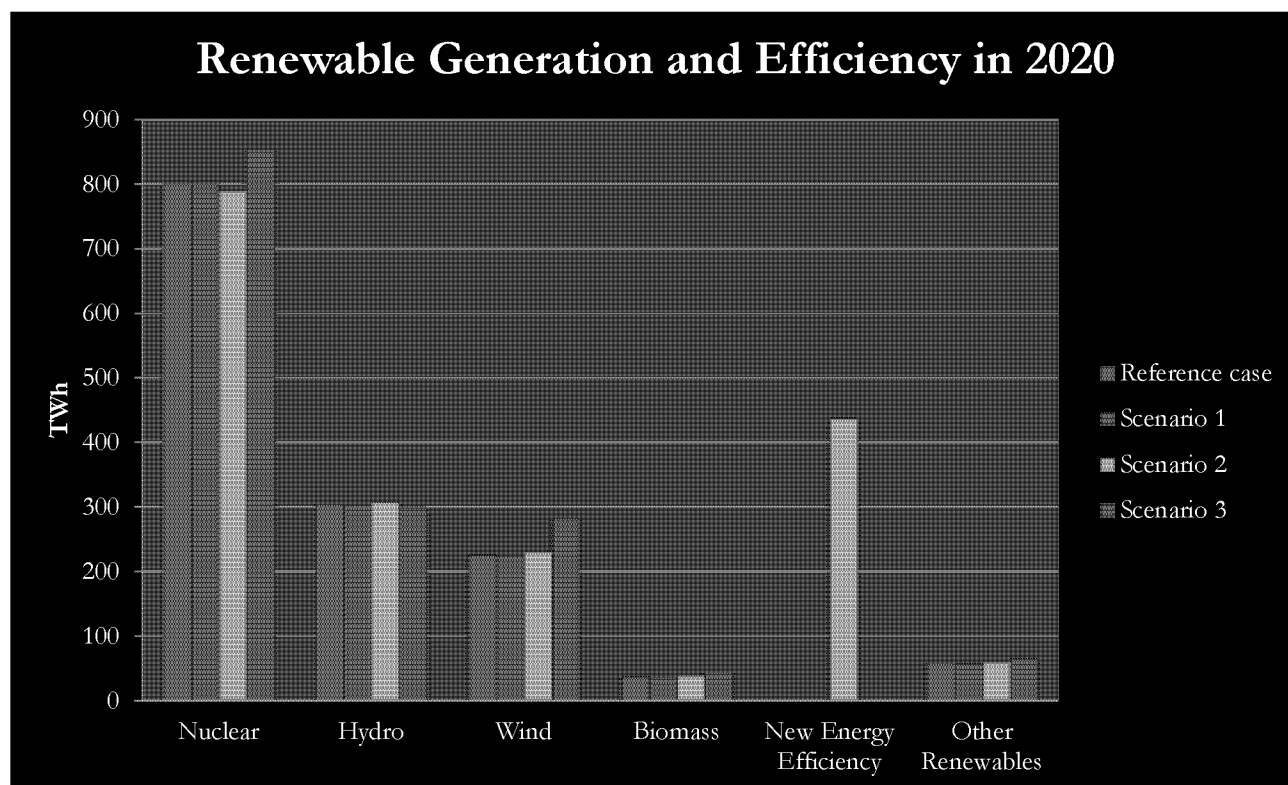


Figure 4b: Power generation by scenario (terawatt hours).



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Carbon Standard Scenarios: Simulation of Power Generation and Emissions

For the Reference Case and three scenarios described above, ICF International used the IPM model to simulate changes power generation and to estimate resulting emissions of CO₂, SO₂, NO_x, primary PM, and mercury for 2417 unique power plants in the U.S. (Lashof 2013, Lashof and Yeh 2014, Macedonia 2014). The potential shift in generation for fossil fuel, renewable, and other sources are shown in Figures 4a and b. Notably, Scenario #1 increases the generation from coal plants without carbon sequestration and storage (CCS). Scenario #2 is the only scenario that includes increased energy efficiency.

The emission results in Figures 5a and b show the annual emission of CO₂ and co-pollutants from the power sector for each scenario. The results for decreases in CO₂ emissions are summarized in Table 2. Scenario #1, which results in modest CO₂ reductions by implementing only improvements “inside the fence line”, results in increased annual SO₂ emissions compared to the Reference Case in 2020. Scenario #2 achieves a 27% decrease in annual emissions of SO₂ and Hg and a 22% cut for NO_x compared to the Reference Case. Similar reductions are achieved by Scenario #3.

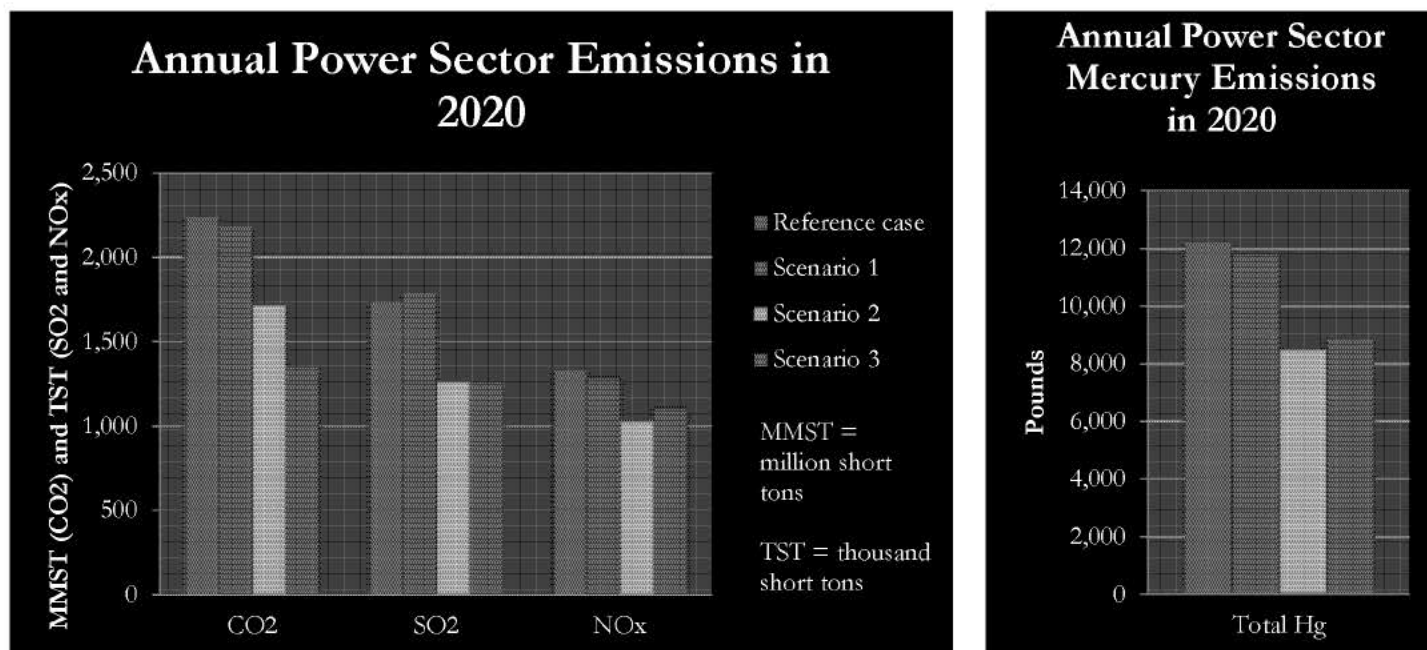
Table 2: Change in carbon dioxide emissions from power sector in 2020 by scenario.

Scenario	From 2005 levels	From Reference
Scenario #1 (Low/Low)	-17.4%	-2.2%
Scenario #2 (Moderate/High)	-35.5%	-23.6%
Scenario #3 (High/Moderate)	-49.2%	-39.8%

Three performance measures were then used in this study to compare the three scenario results and to determine the highest-performing scenario among the three with respect to the co-pollutants considered in this study (Table 3). Importantly, this comparison of performance measures does not represent a full economic or cost-benefit analysis for the scenarios. The performance measures show that Scenario 2 resulted in the largest decrease in SO₂ and NO_x emissions per ton of CO₂ reduced, while still achieving lower annual total system costs than the Reference Case. Total system costs are based on fuel costs, operations and maintenance, and capital costs (Lashof and Yeh 2014, BPC 2014). Note that the lowest cost option (Scenario #1) results in increased SO₂ and NO_x emissions. Scenario #3 achieved less SO₂ and NO_x reductions per ton of CO₂ reduced and at a much higher cost. Based on these performance measures, Scenario #2 was selected to illustrate the air quality and atmospheric deposition benefits of a strong cost-effective standard that achieves substantial emission decreases for CO₂ and the co-pollutants. Results are available for the other scenarios as well.

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Figure 5a & b: Air pollution emissions by scenario (million short tons, thousand short tons, and ponds).

Table 3: Scenario comparison relative to the Reference Case in terms of SO₂ + NO_x emitted per units CO₂ controlled, incremental system costs and incremental costs per mass of CO₂ controlled.

Performance Measures	SO ₂ +NO _x reduced/CO ₂ reduced (TST/MMST) ¹	Incremental Total System Costs \$000,000 (in US 2012\$)	Incremental Total System Cost ² /MMST CO ₂ reduced \$000,000 (in US 2012\$)
Scenario 1	-0.22	-\$1,180	-\$23.40
Scenario 2	1.46	-\$472	-\$0.89
Scenario 3	0.84	\$33,541	\$37.41

¹TST= thousand short tons, MMST = million short tons.²Total system costs are based on Lashof and Yeh (2014) for Scenario #2 and on Macedonia (2014) for Scenario #1 and #3. Costs include fuel costs, operations and maintenance, and capital costs.

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Air Quality and Atmospheric Deposition Results

The results from the CMAQ model show marked differences in air quality and atmospheric deposition among the three scenarios. With respect to the magnitude and direction of change compared to the Reference Case, the air quality and atmospheric deposition results for the three scenarios parallel the annual emissions results described above. The lowest improvements and some increased impacts occur in Scenario #1 with greater improvements for the various pollutants occur for Scenario 2 and #3. The results underscore the fact that different options for carbon standards can have widely varied consequences for associated air pollution. The details of the carbon standard will exert considerable influence on the health and environmental benefits that accrue to states and local communities.

Scenario #1, the low stringency/low flexibility heat-rate option results in increased SO₂ emissions and minimal decreases in NO_x and mercury emissions. As a result, there is increased sulfur deposition (Figure 6a) and higher fine particle pollution (PM_{2.5}) (Figure 6b) across large areas with little to no improvement in most of the remaining area. The number of states with increases, no change, and decreases in average statewide air pollution levels are depicted for all three scenarios in Figures 7c, 8c, 9c, and 10c. This result is likely due to widespread “emissions rebound” at numerous fossil-fuel-fired power plants in the U.S. fleet. Emissions rebound refers to the increase in emissions that can occur when higher-emitting plants are made more efficient and therefore rise in the dispatch order and run more frequently and for longer periods than in the Reference Case. This emissions rebound effect has been anticipated by others (Phillips 2014) but this is the first time the consequences for air quality at the state level have been quantified and mapped.

Scenarios #2 and #3 both result in lower annual emissions of SO₂, NO_x, and Hg, resulting in a decrease in air pollution nationwide. Scenario #2 results in improved air quality and decreased atmospheric deposition of pollution in all the lower 48 states in the U.S. The following maps and tables depict the projected changes in 2020 associated with Scenario #2 (Figures 7 to 11; Table 4-8). Scenario #3 had similar air quality and atmospheric deposition results but at a much higher cost.

The CMAQ results for Scenario #1 show that if a carbon standard has low stringency and compliance limited to strictly “inside the fence” options, emissions of co-pollutants could increase, leading to increased pollutant loading and diminished air quality and potential adverse effects on public and environmental health. The CMAQ results of Scenario #2 show that a carbon standard that is stringent and flexible enough to promote a shift toward cleaner sources will reduce emissions of co-pollutants, achieve improved air quality and decreased atmosphere deposition of pollution, and lead to marked health and environmental benefits at the state level.

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Figure 6a: Projected changes in total annual sulfur deposition under Scenario #1 in 2020
(kilograms per hectare-year).

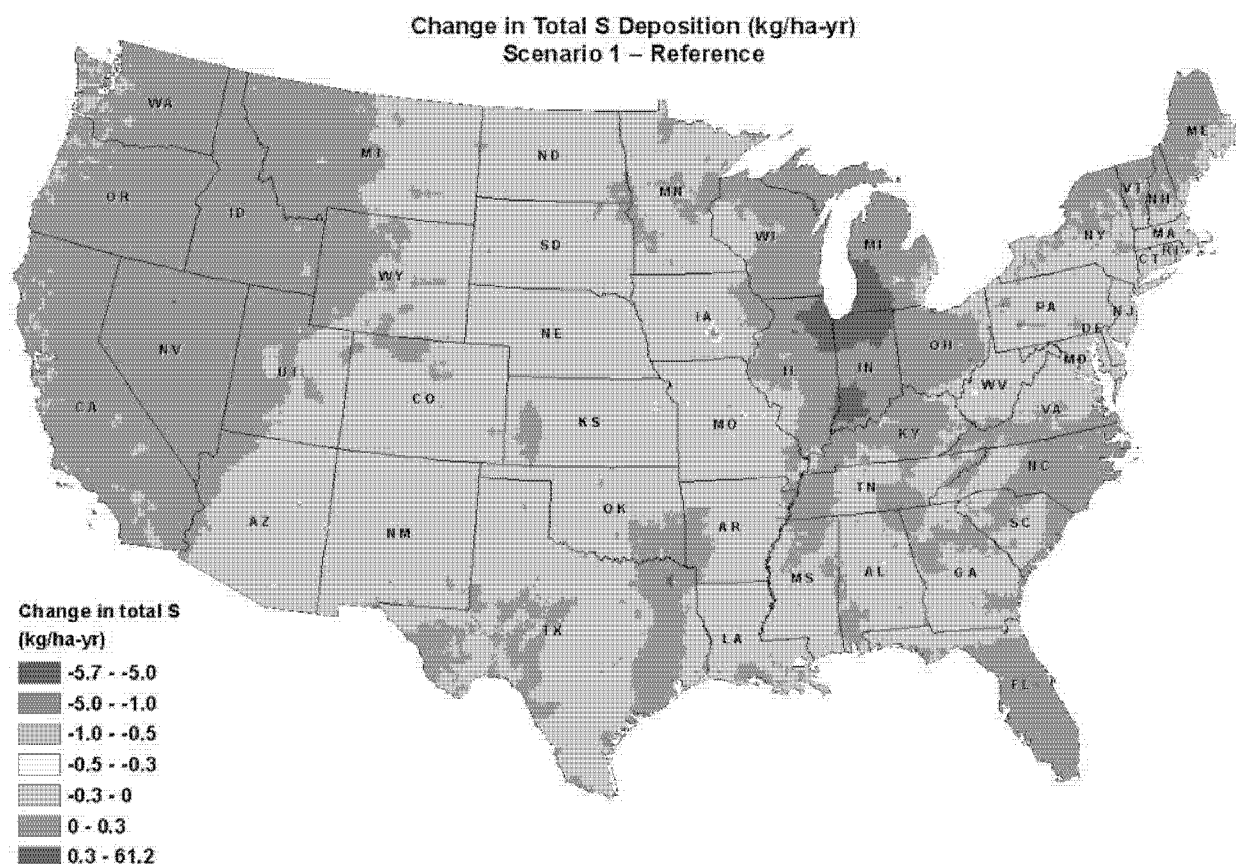
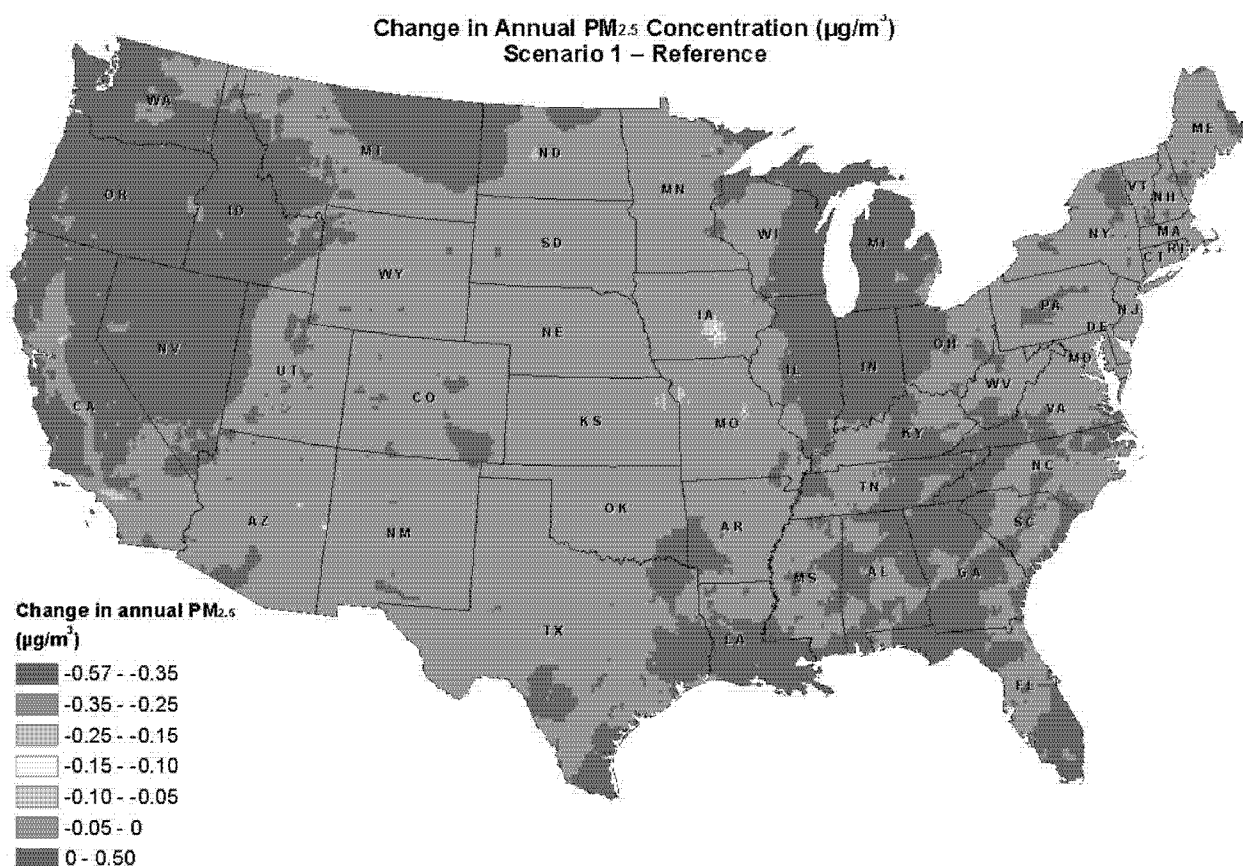


Figure 6b: Projected changes in average annual $PM_{2.5}$ from the Reference Case under Scenario #1 in 2020
(micro-grams per cubic meter).



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Figure 7a & b: Average annual PM_{2.5} in 2020 for the Reference Case and change from this condition in Scenario #2 (micro-grams per cubic meter).

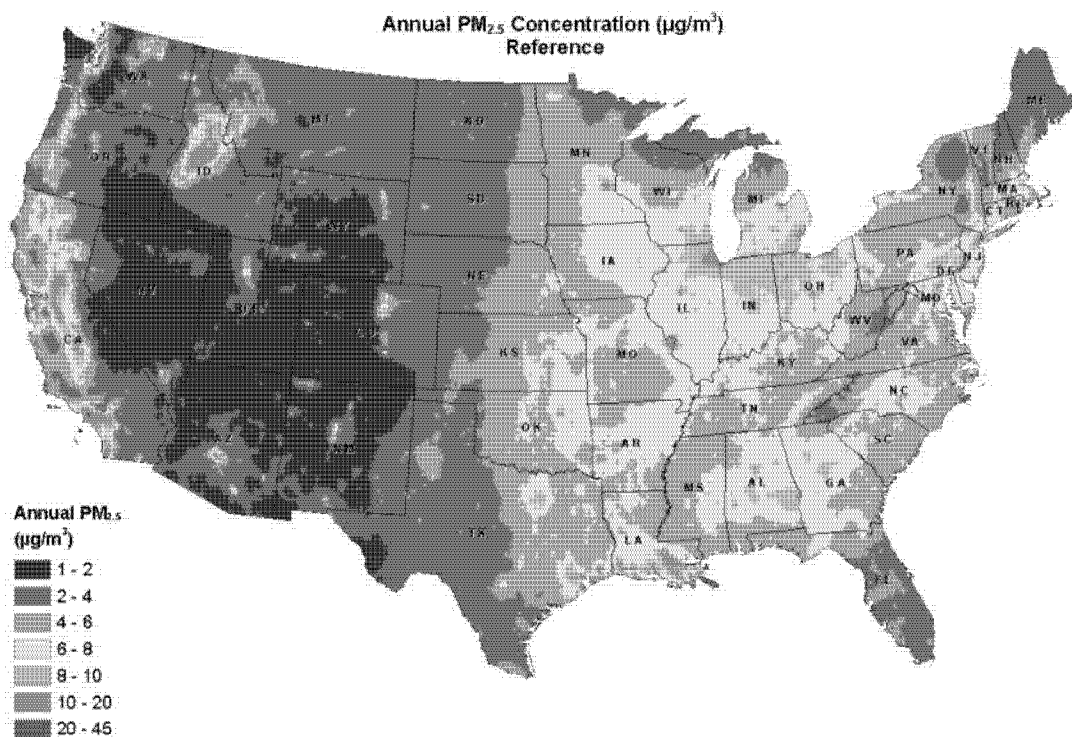


Figure 7a

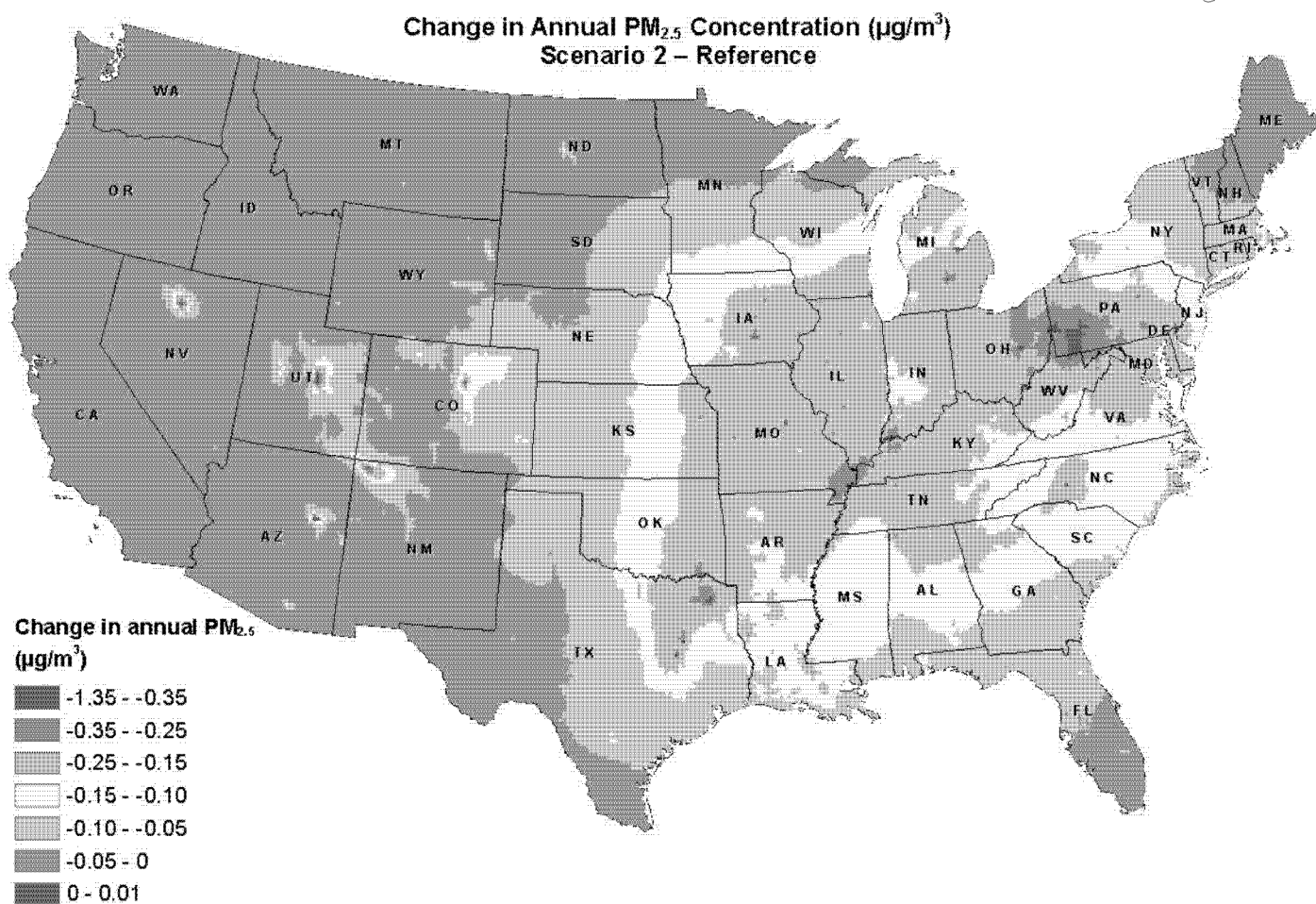


Figure 7b

Figure 7c

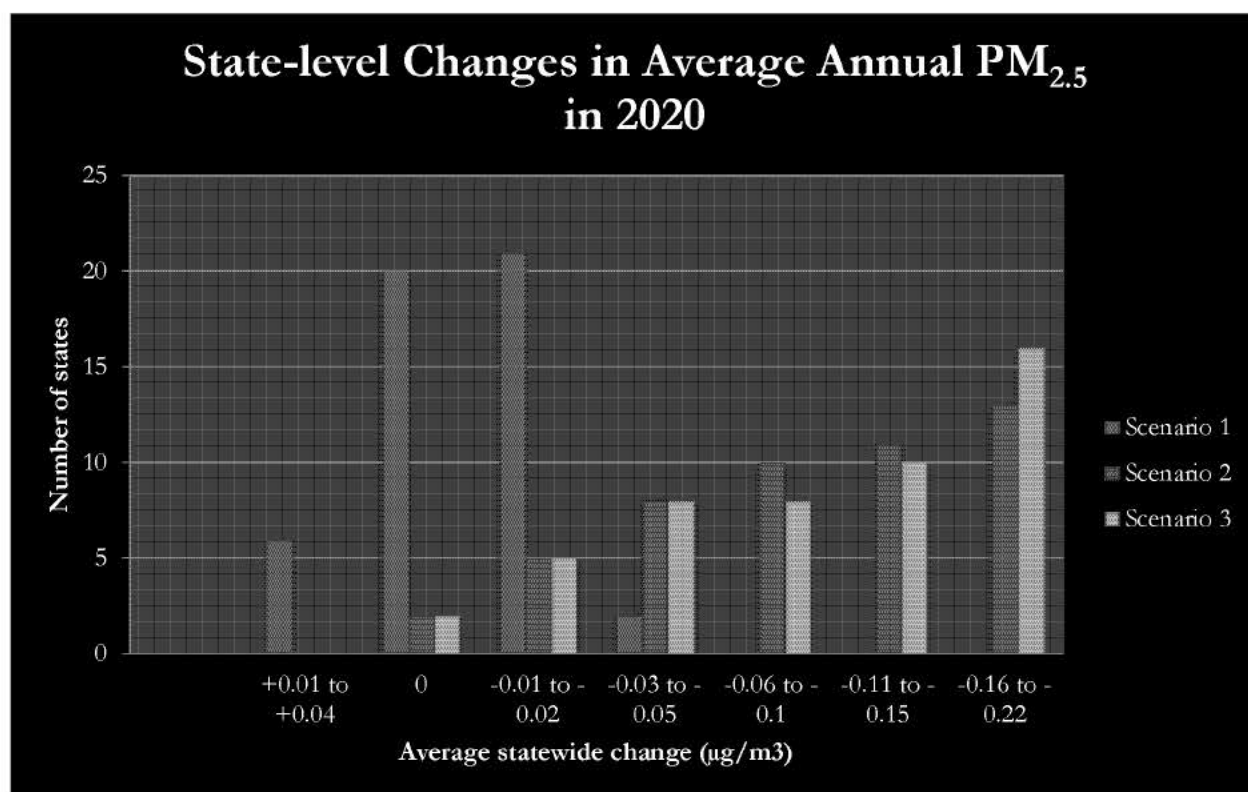
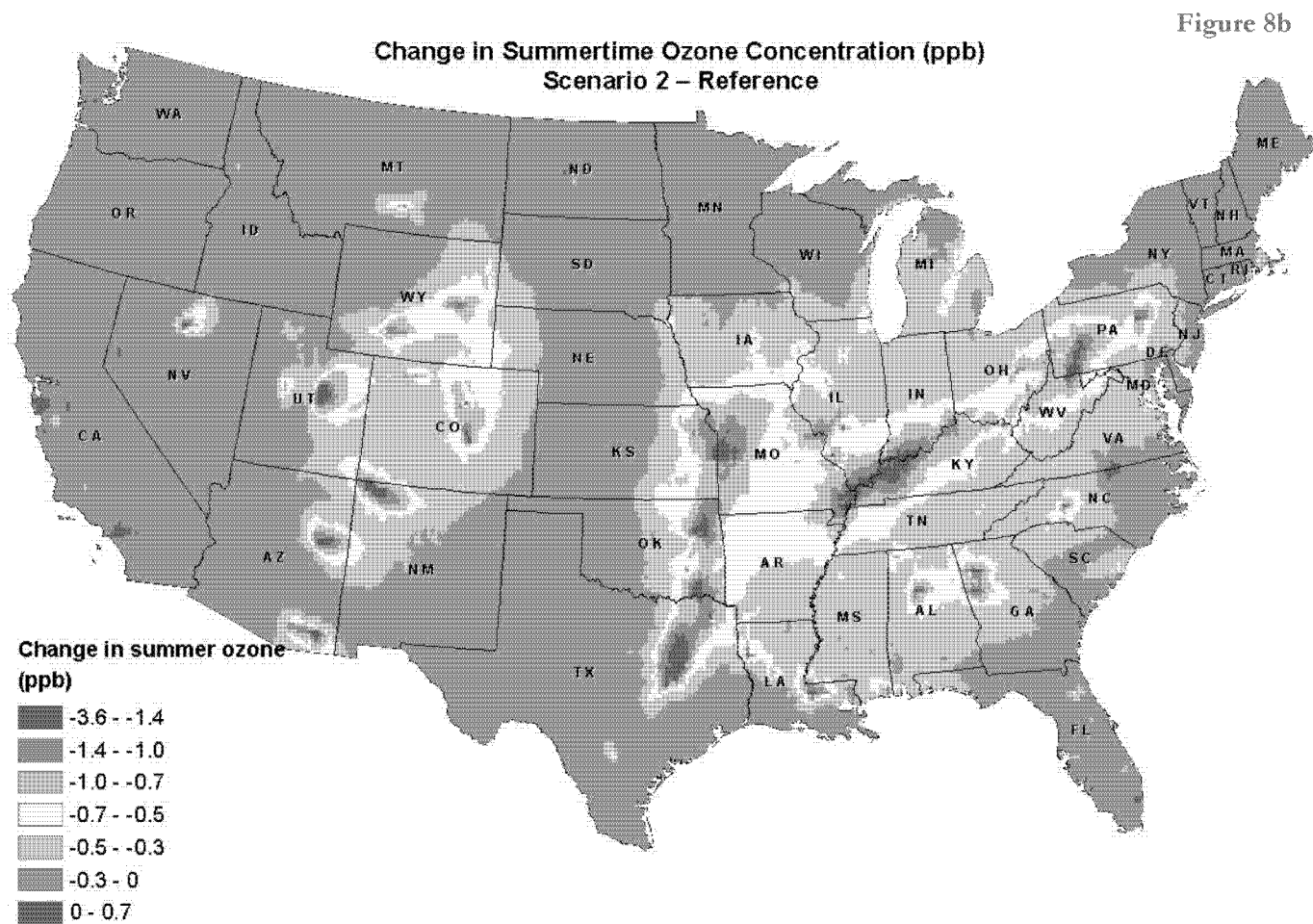
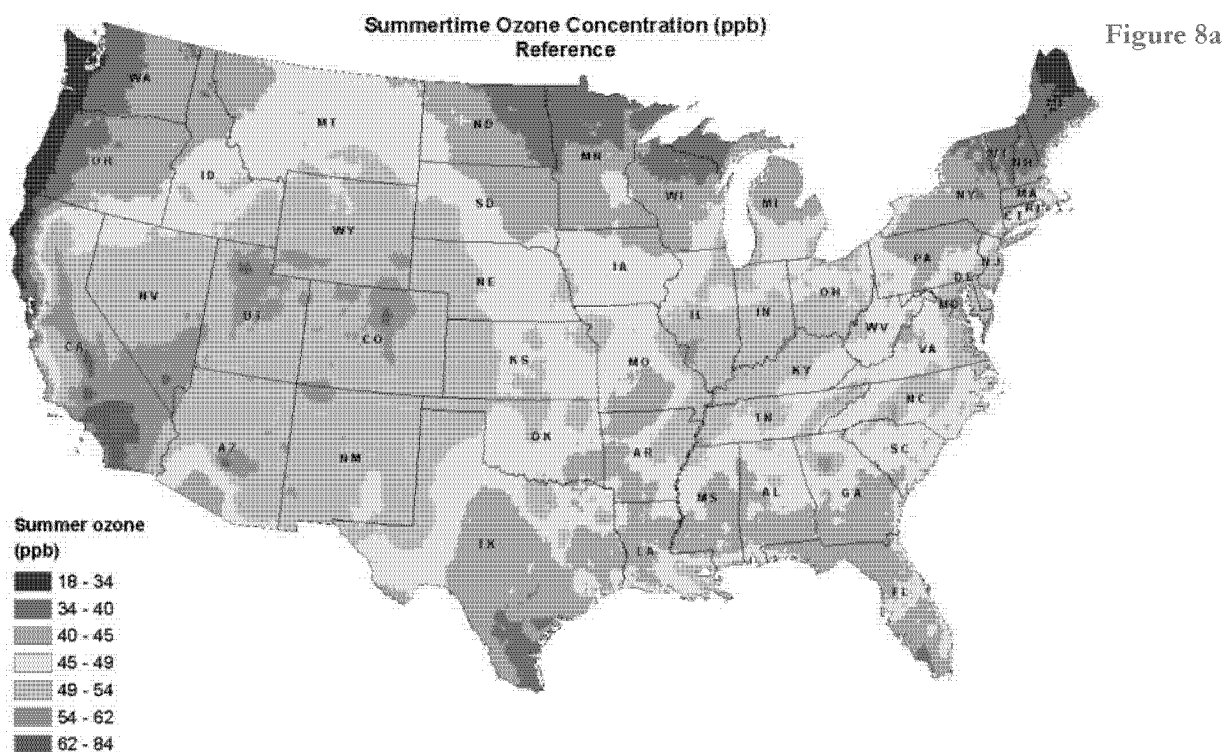


Table 4

Top 15 States with Largest Decreases in Average Annual PM _{2.5}		
State	Scenario 2 (µg/m ³)	Mean Decrease (µg/m ³)
Ohio	7.66	0.22
Pennsylvania	5.86	0.22
DC	12.68	0.20
Maryland	6.79	0.20
W. Virginia	4.93	0.20
Illinois	7.40	0.19
Missouri	5.93	0.18
Delaware	6.57	0.18
Kentucky	5.97	0.18
Indiana	7.77	0.17
Arkansas	6.15	0.17
Tennessee	5.52	0.16
Iowa	6.22	0.16
Virginia	5.26	0.15
New Jersey	7.13	0.14

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Figure 8a & b: Average summer (June 1 – August 31) peak 8-hr ozone for Reference Case and change in this condition for Scenario #2 (parts per billion).



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Figure 8c

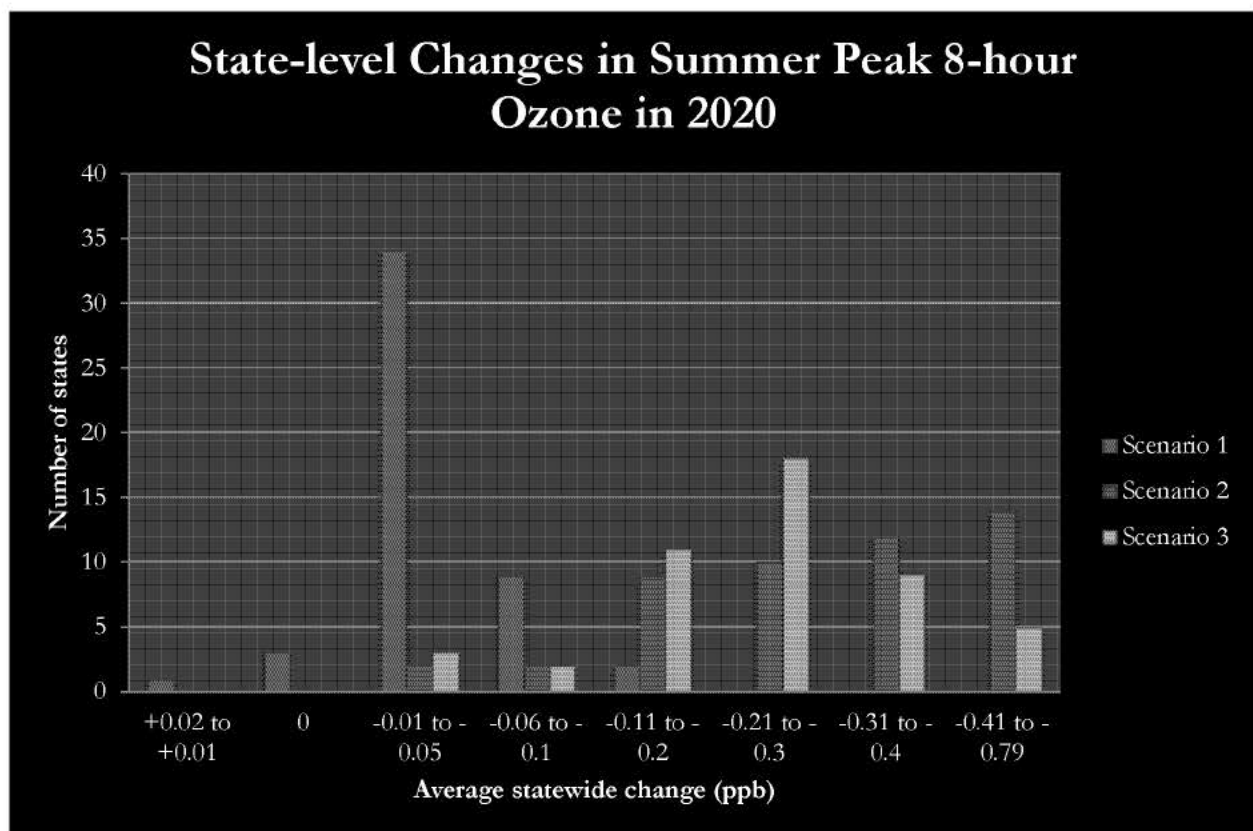
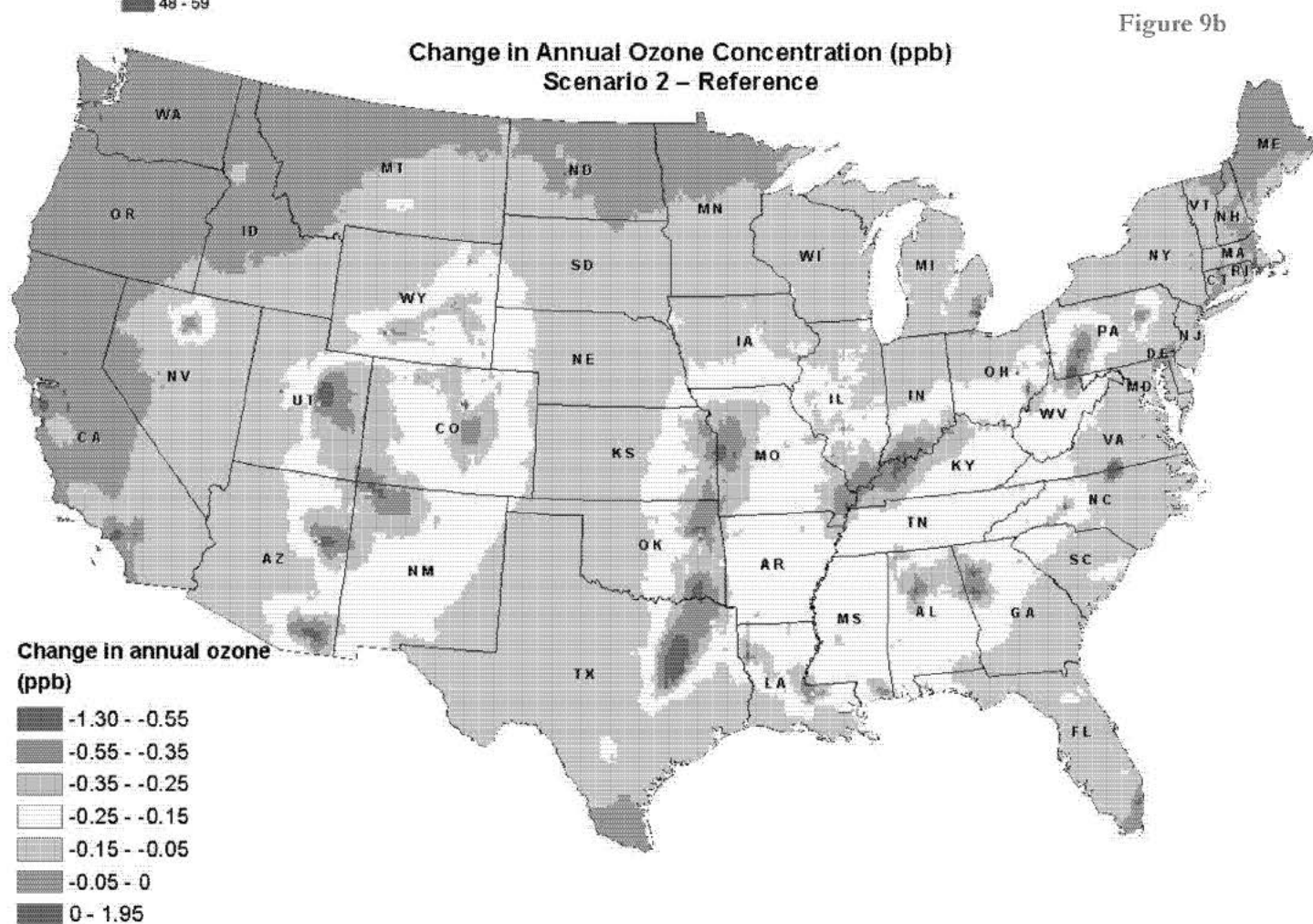
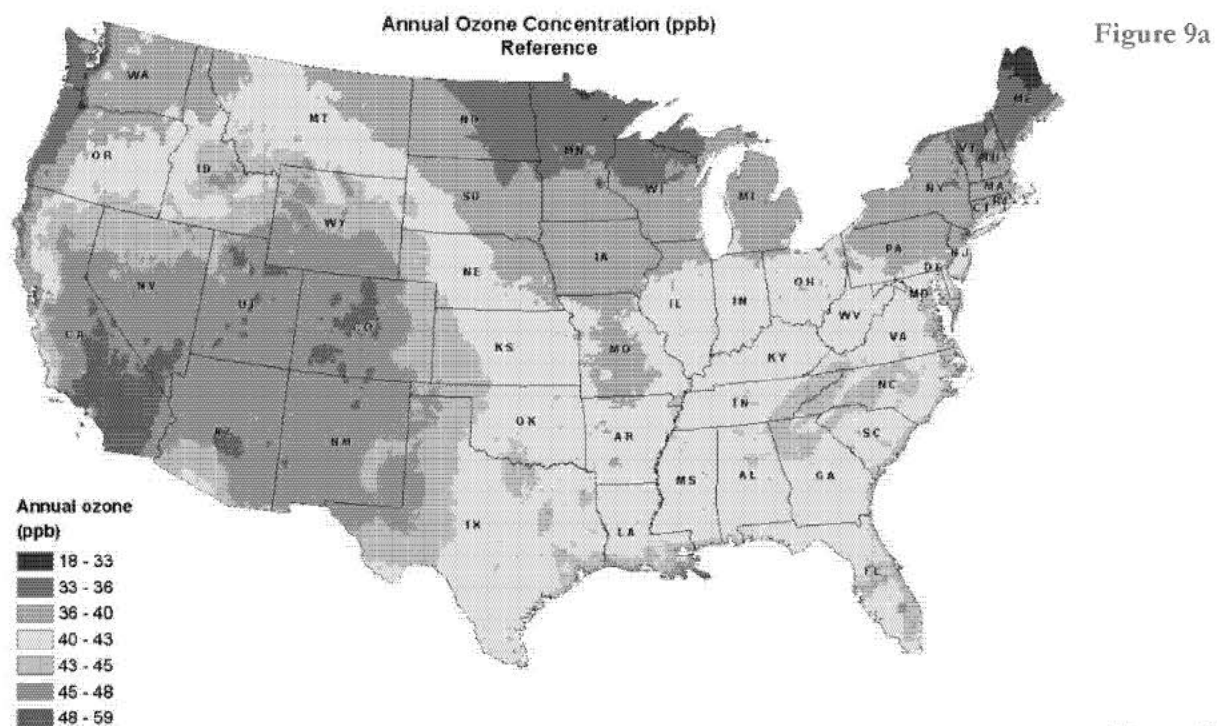


Table 5

Top 15 States with Largest Decreases in Average Summer Peak 8-hour Ozone		
State	Scenario #2 (ppb)	Mean decrease (ppb)
Kentucky	49.12	-0.79
Missouri	46.73	-0.75
Pennsylvania	44.75	-0.62
W. Virginia	46.85	-0.59
Indiana	49.67	-0.56
Arkansas	46.03	-0.54
Illinois	49.69	-0.52
Ohio	49.24	-0.51
Oklahoma	47.39	-0.48
Tennessee	49.11	-0.48
Colorado	52.66	-0.45
Alabama	45.13	-0.44
Iowa	46.15	-0.40
Wyoming	51.35	-0.40
Georgia	45.43	-0.39

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Figure 9a & b: Average annual peak 8-hr ozone for Reference Case and change in this condition for Scenario #2 (parts per billion).



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Figure 9c

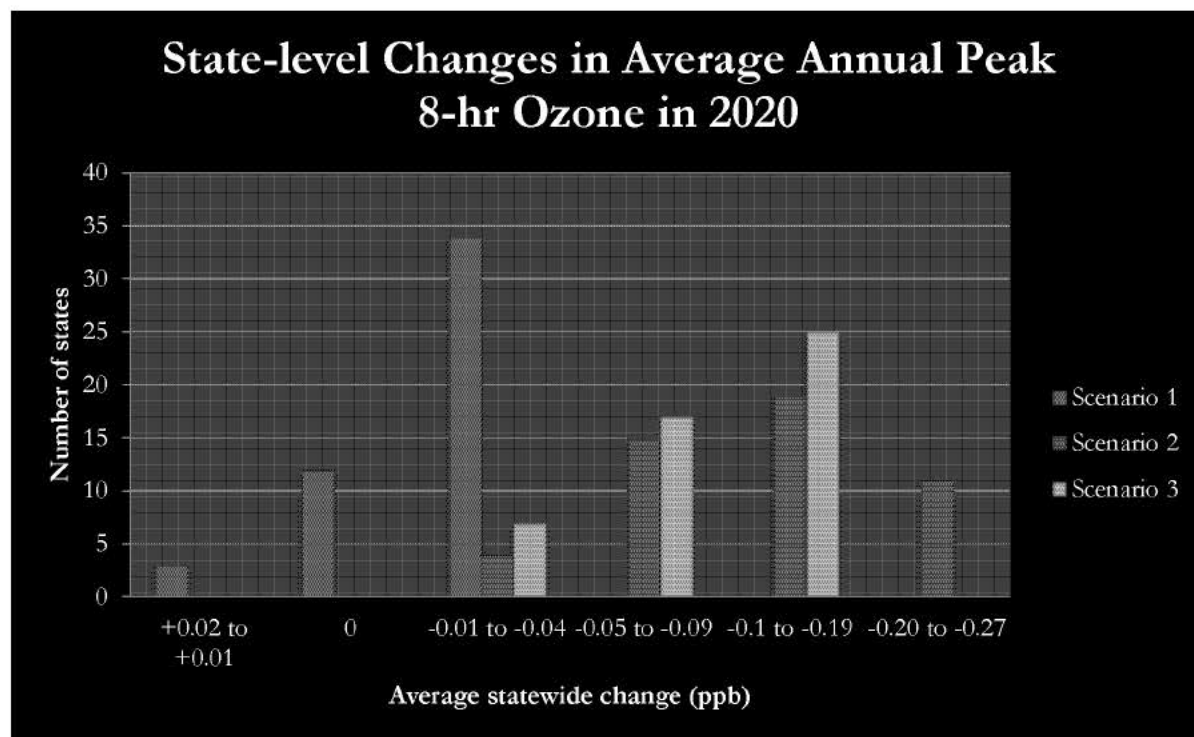
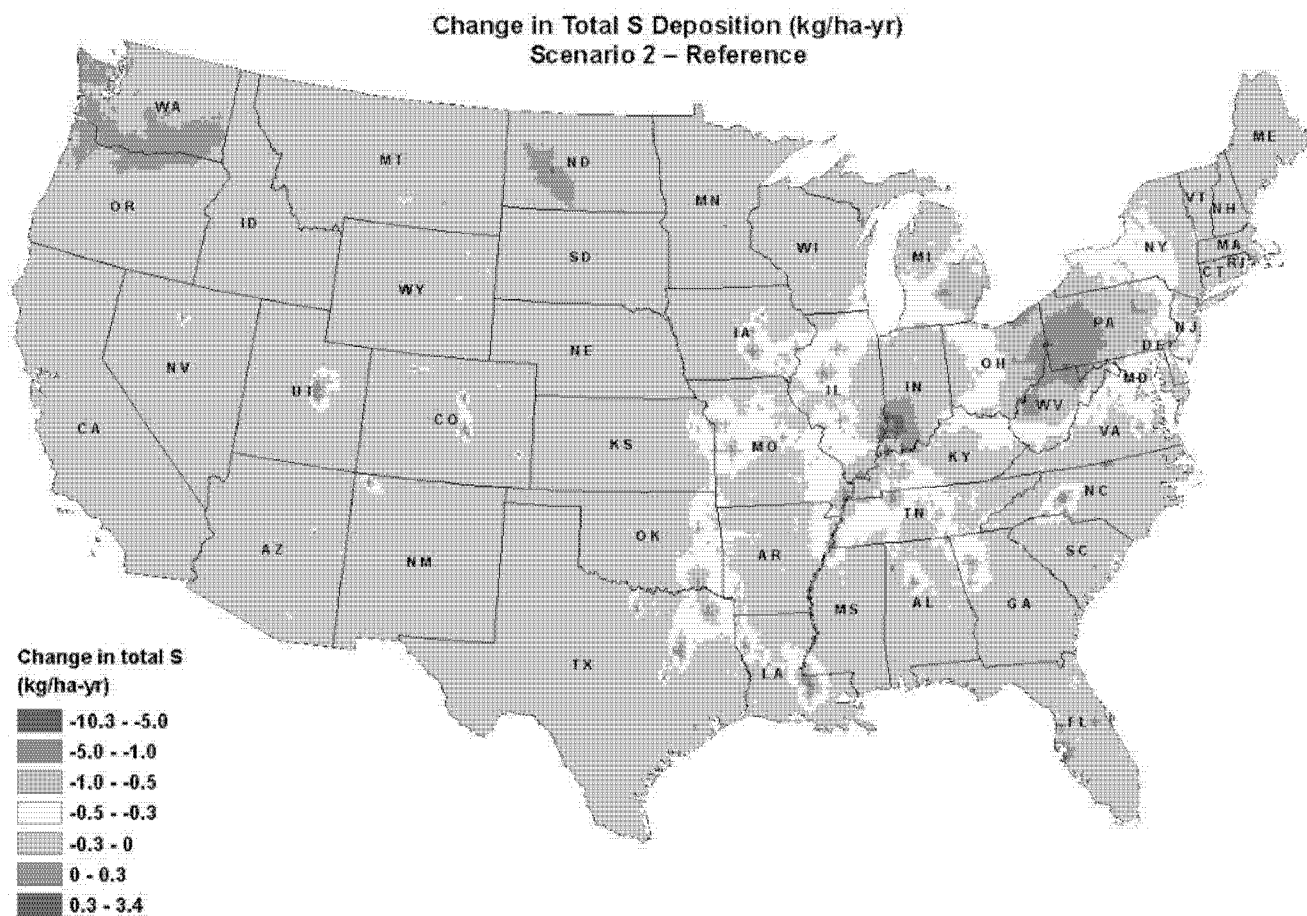
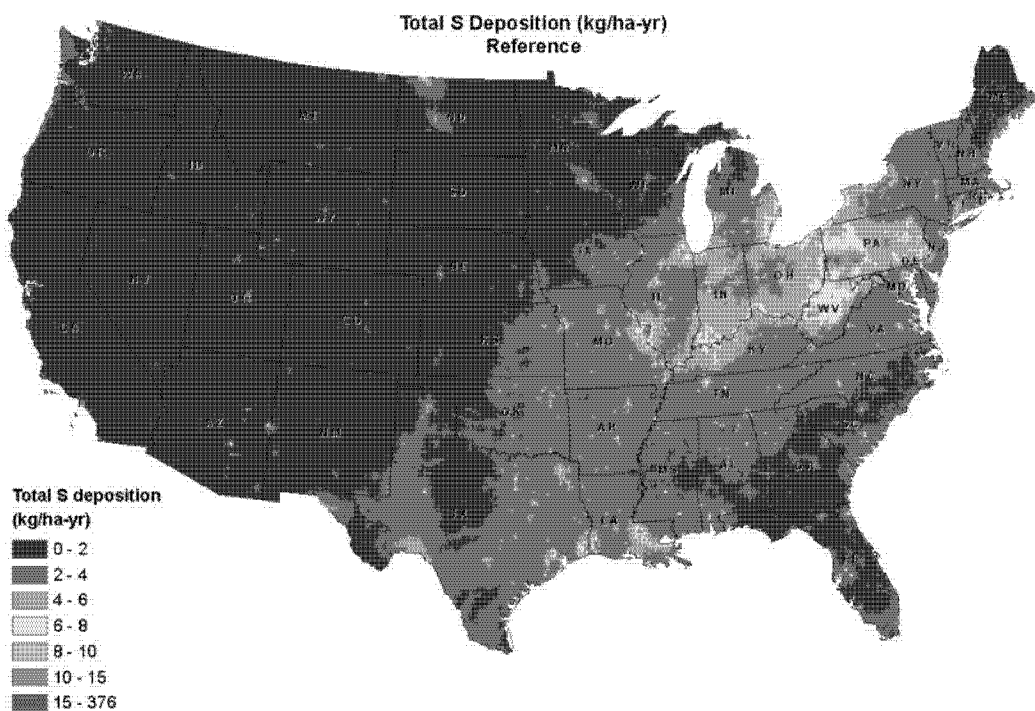


Table 6

Top 15 States with Largest Decreases in Average Annual Peak 8-hr Ozone		
State	Scenario 2 (ppb)	Mean Decrease (ppb)
Kentucky	41.60	0.27
Missouri	39.92	0.27
Colorado	46.22	0.24
Alabama	41.47	0.22
Arkansas	40.86	0.21
W. Virginia	41.42	0.21
Oklahoma	42.10	0.21
New Mexico	46.00	0.21
Tennessee	42.39	0.20
Utah	46.35	0.20
Louisiana	42.43	0.20
Indiana	41.05	0.19
Pennsylvania	39.26	0.19
Illinois	40.72	0.19
Mississippi	41.16	0.18

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Figure 10a & b: Total annual sulfur deposition in 2020 for Reference Case and change in this condition for Scenario #2 (kilograms S per hectare-year).



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Figure 10c

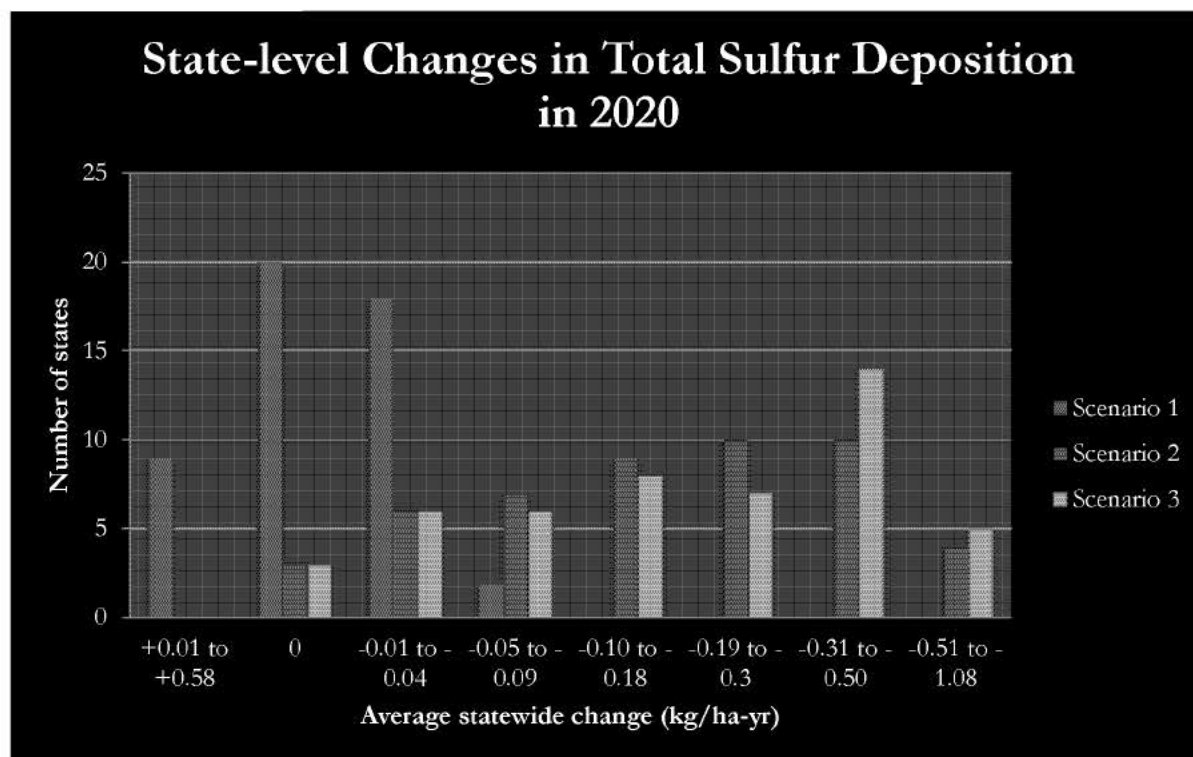


Table 7

Top 15 States with Largest Decrease in Average Annual Total S Deposition		
State	Mean Decrease (kg S/ha-yr)	Percent decrease
Pennsylvania	1.08	17.24%
W. Virginia	0.81	13.73%
Ohio	0.60	11.98%
Maryland	0.52	12.97%
Kentucky	0.38	9.20%
Delaware	0.36	10.94%
Illinois	0.36	8.79%
Rhode Island	0.35	8.90%
New Jersey	0.35	9.63%
Tennessee	0.34	11.45%
New York	0.34	9.64%
DC	0.34	6.52%
Missouri	0.34	10.36%
Michigan	0.31	10.14%
Virginia	0.29	9.67%

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Figure 11a & b: Total annual nitrogen deposition for Reference Case and change in this condition for Scenario #2 (kilograms N per hectare-year).

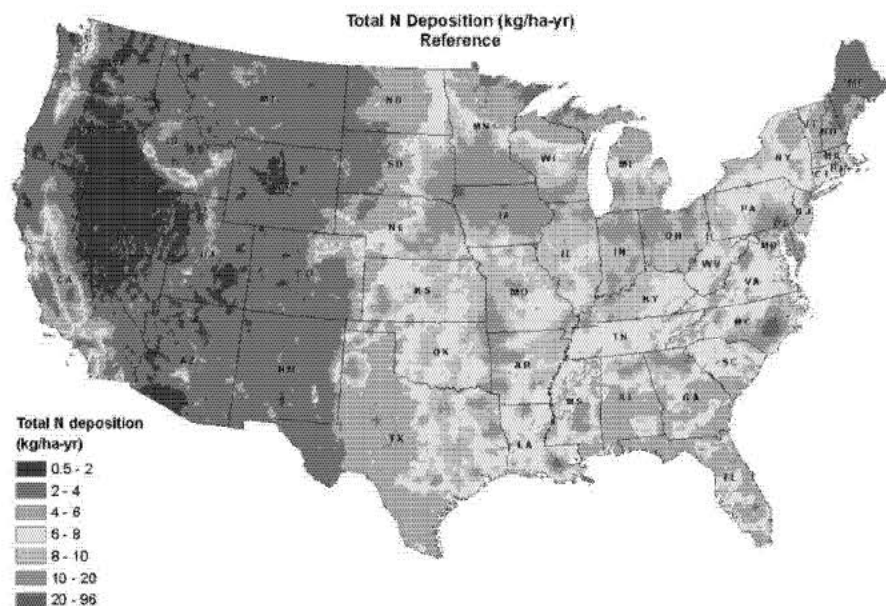


Figure 11a

Table 8

Top 15 States with Largest Decreases in Average Annual Total N Deposition		
State	Mean Decrease (kg N/ha-yr)	Percent decrease
Pennsylvania	0.14	2%
Indiana	0.12	1%
W. Virginia	0.12	2%
Missouri	0.11	1%
Kentucky	0.11	1%
Illinois	0.11	1%

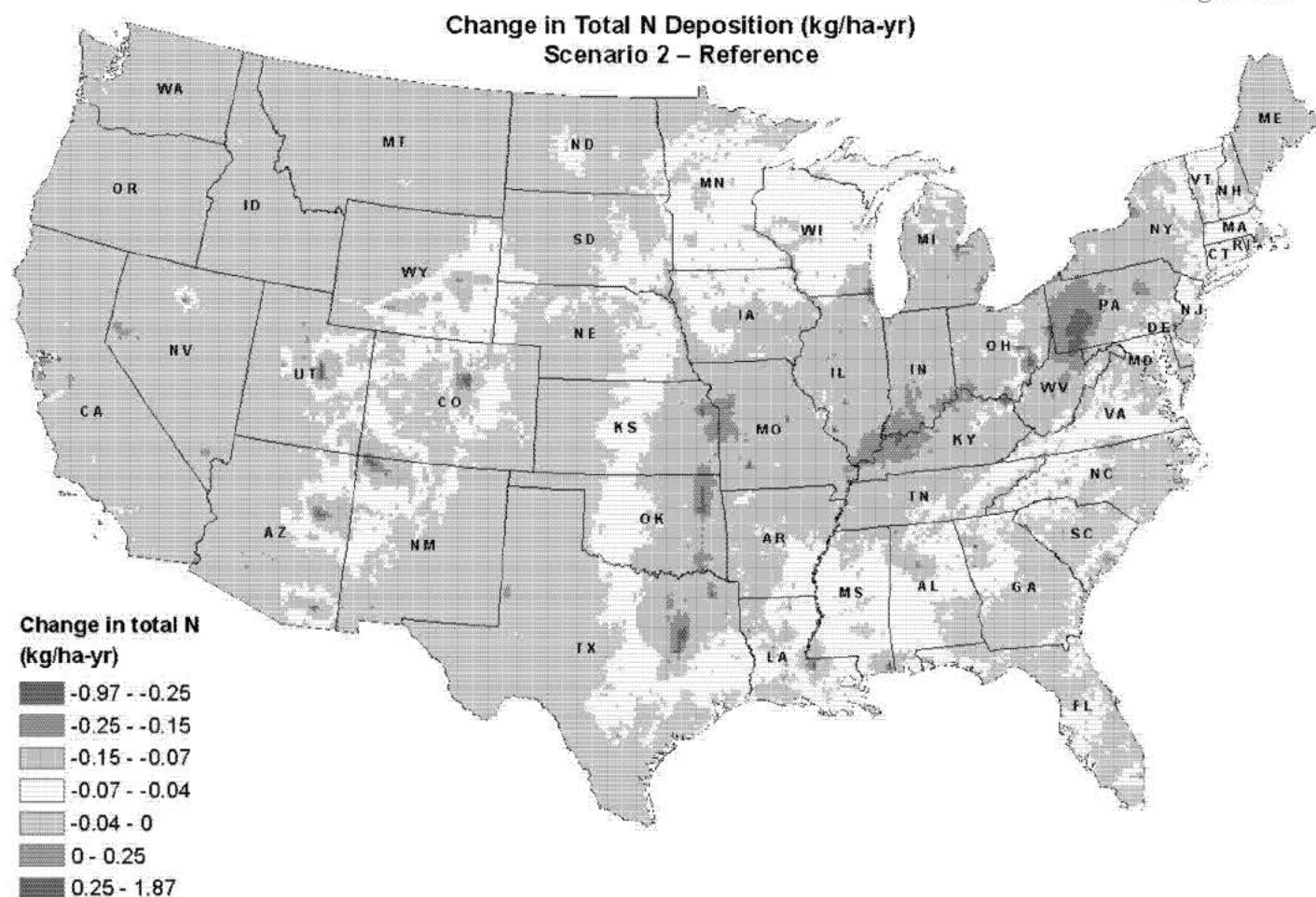


Figure 11b

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Summary of Results

This study highlights that, in addition to addressing global climate change, a strong carbon pollution standard for existing power plants will reduce power plant emissions of co-pollutants that contribute to local and regional air pollution.

Details: The top-performing moderate stringency/high flexibility option depicted in Scenario #2 cuts CO₂ emissions from the power sector are cut by 35.5% from 2005 levels by 2020 and by 23.6% from a 2020 Reference Case. Scenario #2 also decreases power plant emissions of co-pollutants by the following amounts in 2020 compared to the Reference Case:

- SO₂ emissions *decrease* by 474,000 short tons/year (-27%)
- NO_x emissions *decrease* by 299,000 short tons/year (-22%)
- Hg emissions *decrease* by 3,334 pounds/year (-27%)

By contrast, the study also highlights how a carbon standard with low stringency and low compliance flexibility as depicted in Scenario #1 could result in the following changes in power sector emissions by 2020 compared to the Reference Case:

- SO₂ emissions *increase* by 50,000 short tons/year (+3%)
- NO_x emissions *decrease* by 39,000 short tons/year (-3%)
- Hg emissions *decrease* by 414 pounds/year (-3.3%)

2. The model results show that by reducing the emission of co-pollutants, a strong carbon pollution standard will improve air quality and decrease the deposition of harmful pollutants. It has been well-documented that even modest improvements can bring human health and ecosystem benefits.

Details: The CMAQ model runs quantify by how much and where air quality and atmospheric deposition would change under each of the three scenarios. It is clear from the results that the air quality improvements achieved in 2020 under a strong carbon standard would have the added benefit of improving the health of people and ecosystems in states across the U.S. Specifically, for Scenario #2:

- Average annual concentrations of fine particulate matter (PM_{2.5}) at the state level will decrease by 0.0 to 0.22 µg/m³ with the top 15 states experiencing average decreases of 0.14 to 0.22 µg/m³.
- Summertime average peak 8-hour ozone concentrations at the state level will decrease by 0.01 to 0.79 ppb with the top 15 states experiencing average decreases of 0.39 to 0.79 ppb.
- Annual average ozone peak 8-hour ozone concentrations at the state level will decrease by 0.01 to 0.27 ppb with the top 15 states experiencing average decreases of 0.18 to 0.27 ppb.

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- Total annual sulfur deposition at the state level will decrease by 0.0 to 1.08 kg/ha-yr with the top 15 states experiencing average decreases of 0.29 to 1.08 kg/ha-yr.

A complete health and ecosystem benefits analysis has not yet been conducted but past studies conducted by EPA for other proposed air pollution standards have shown that seemingly small improvements in air quality equate to substantial public health benefits. For example, the U.S. EPA's Mercury and Air Toxics Rule, issued in 2011, would reduce annual average $PM_{2.5}$ concentrations by an estimated $0.36 \mu\text{g}/\text{m}^3$ and annual average 8-hr ozone concentrations by 0.2 ppb. The U.S. EPA estimated the annual health benefits of this rule to be 7,600 avoided premature mortality cases (between 4,200 to 11,000), 4,700 avoided non-fatal heart attacks, 130,000 avoided asthma attacks, 5,700 avoided hospital and emergency department visits, 540,000 days of missed work or school, and 3,200,000 restricted activity days. These health benefits were valued between \$120 and \$280 billion. In Part 2 of this report the health benefits and their economic value will be calculated nationally and for each of the lower 48 states and District of Columbia.

Ecosystems would also benefit from decreases in air pollution and atmospheric deposition of sulfur and nitrogen. Reduced ground-level ozone will increase the health and productivity of crops and timber. The projected declines in sulfur deposition will contribute to the recovery of acid-impacted forest watersheds such as the Appalachian Mountain region. Nitrogen deposition is projected to decrease by only 1% to 2%, but there will be modest benefits associated to decreases in ecosystem eutrophication. Note that this analysis is based on total nitrogen deposition which includes both nitrate deposition (driven largely by emission of nitrogen oxides from fossil fuel combustion) and ammonium deposition (driven largely by agricultural emissions). The relative decrease under Scenario #2 would be expected to be approximately two times greater for nitrate deposition alone.

3. The model results show that the air quality and atmospheric deposition improvements associated with decreased co-pollutants are widespread, with every state receiving some benefit. The largest decreases in pollution occur in the eastern US, particularly in states in and around the Ohio River Valley with notable improvements in Rocky Mountain region as well.

Details: The CMAQ results for Scenario #2 provide spatially explicit results that show where the greatest improvements are likely to occur.

- States that are projected to benefit from the largest statewide average decreases in air pollution detrimental to human health ($PM_{2.5}$ and peak annual and summer O_3) include: OH, PA, MD, WV, IL, KY, MO, IN, AR, CO, AL and WV (based on the top 6 states for each pollutant).

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- States that are projected to benefit from the largest statewide average decreases in air pollution detrimental to ecosystems (sulfur and nitrogen) include: PA, WV, OH, MD, KY, DE, IN, IL, and MO (based on the top 6 states for each pollutant).
- Most other states see marked improvements in both air quality and atmospheric deposition of pollutants that vary geographically.

4. Finally, the analysis suggests that the stronger the standards (in terms of both stringency and flexibility), the greater and more widespread the benefits will be from decreased co-pollutants. It also shows that a weaker standard focused strictly on power plant retrofits could increase emissions and reduce air quality over large areas. The resulting improvements in air quality associated with a strong carbon pollution standard would have nearly immediate benefits by reducing illness and premature deaths. Moreover, decreased air pollution will help to continue reversing the damage brought by years of acid, nitrogen deposition, and mercury deposition. In so doing, carbon pollution standards can protect public health and help restore forests, waters, and wildlife, while also mitigating climate change.

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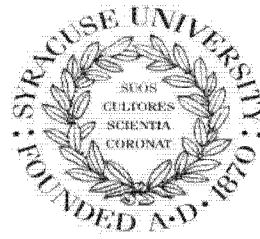
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Co-benefits of Carbon Standards Part 1: Air Pollution Changes under Different 111d Options for Existing Power Plants is available at: eng-cs.syr.edu/carboncobenefits

FOR IMMEDIATE RELEASE

May 27, 2014
Press Release

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HARVARD
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Center for Health
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Rules to Cut Carbon Emissions Also Reduce Air Pollution Harmful to People and the Environment

New study by Syracuse and Harvard universities shows potential for reductions of more than 750 thousand tons of other harmful air pollutants across continental U.S.

(Syracuse, NY – May 27, 2014) Setting strong standards for climate-changing carbon emissions from power plants would provide an added bonus – reductions in other air pollutants that can make people sick; damage forests, crops, and lakes; and harm fish and wildlife. This, according to a first-of-its-kind study released today by scientists at Syracuse University and Harvard who mapped the potential environmental and human health benefits of power plant carbon standards.

The authors of the new study, *Co-benefits of Carbon Standards: Air Pollution Changes under Different 111d Options for Existing Power Plants*, use three policy options for the forthcoming EPA rule as a guide to model changes in power plant emissions of four other harmful air pollutants: **fine particulate matter, nitrogen oxides, sulfur dioxide, and mercury**. The scientists compared the model results with a business-as-usual reference case for the year 2020.

Of the three scenarios simulated, the top-performing option decreased sulfur dioxide and mercury emissions by 27% and nitrogen oxide emissions by 22% by 2020 compared to the reference case. This option reduced carbon dioxide emissions from the power sector by 35% from 2005 levels by 2020. The scientists state that the resulting air quality improvements are likely to lead to significant gains in public and environmental health.

“When power plants limit carbon dioxide emissions, they can also release less sulfur dioxide, nitrogen oxide and other pollutants,” said Dr. Charles Driscoll of Syracuse University. “One of

the policy options we analyzed cut emissions of these non-carbon pollutants by approximately 750,000 tons per year by 2020,” Driscoll said.

“We know that these other pollutants contribute to increased risk of premature death and heart attacks, as well as increased incidence and severity of asthma and other health effects. They also contribute to acid rain, ozone damage to trees and crops, and the accumulation of toxic mercury in fish,” added Driscoll. “This new analysis shows that there is a real opportunity to help reverse decades of environmental damage from power plant emissions and to improve human health,” he said.

In addition to summarizing changes in emissions, the study quantifies the resulting improvements in air quality. It features detailed maps illustrating the benefits of decreased emissions from roughly 2,400 power plants for every 12x12km area of the continental United States. With a strong carbon standard, improvements are widespread and every state receives some benefit. The maps show that the greatest benefits occur in the eastern U.S., particularly in states in and around the Ohio River Valley, as well as the Rocky Mountain region.

- States that are projected to benefit from the **largest average decreases in fine particle pollution (PM2.5) and summer ozone pollution detrimental to human health** include: Ohio, Pennsylvania, Maryland, West Virginia, Illinois, Kentucky, Missouri, Indiana, Arkansas, Colorado, and Alabama (based on the top 6 states for each pollutant).
- States that are projected to benefit from the **largest average decreases in sulfur and nitrogen pollution detrimental to ecosystems** include: Pennsylvania, West Virginia, Ohio, Maryland, Kentucky, Delaware, Indiana, Illinois, and Missouri (based on the top 6 states for each pollutant).
- Most other states see improvements in both air quality and atmospheric deposition of pollutants which vary state to state.

The findings also show that different policy options yield different outcomes. The detailed air quality modeling makes it clear that a modest rule limited to making power plant improvements “inside the fence,” similar to what some industry groups have proposed, would bring little if any air quality benefits for states.

“Our analysis demonstrates that strong carbon standards could also have widespread benefits to air quality and public health,” said Dr. Jonathan Buonocore, of the Harvard School of Public Health at Harvard University. “With a mix of stringency and flexibility, the new EPA rules have the potential to substantially reduce emissions of sulfur dioxide and nitrogen oxides from power plants, which contribute to local and regional air pollution. This is an opportunity to both mitigate climate change and protect public health.”

The U.S. EPA is expected to release its proposed rules for carbon pollution from existing power plants June 2.

The new Syracuse and Harvard study and maps can be downloaded at:

eng-cs.syr.edu/carboncobenefits.

###

Syracuse University (SU) is a private research university dedicated to advancing knowledge and promoting student success through teaching excellence, scholarship, and interdisciplinary research.

Harvard School of Public Health brings together dedicated experts from many disciplines to educate new generations of global health leaders and produce powerful ideas that improve the lives and health of people everywhere.

The Carbon Standards Co-benefit Analysis is a project of the Science Policy Exchange, a research consortium dedicated to increasing the impact of science on conservation and environmental policy.

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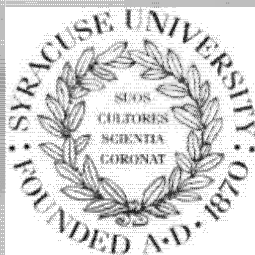
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Co-Benefits of Carbon Standards Study

Part 1

May 27, 2014



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Today's Speakers

Kathy Fallon Lambert (moderator), M.S.,
Director of Science Policy Exchange; Harvard
Forest, Harvard University



Charles Driscoll, Jr, PhD, NAE; Distinguished Professor
and University Professor of Environmental Systems
Engineering; Department of Civil and Environmental
Engineering; Syracuse University



Jonathan Buonocore, Sc.D.,
Program Leader; Climate,
Energy, and Health; Center for
Health and the Global
Environment; Harvard School of
Public Health

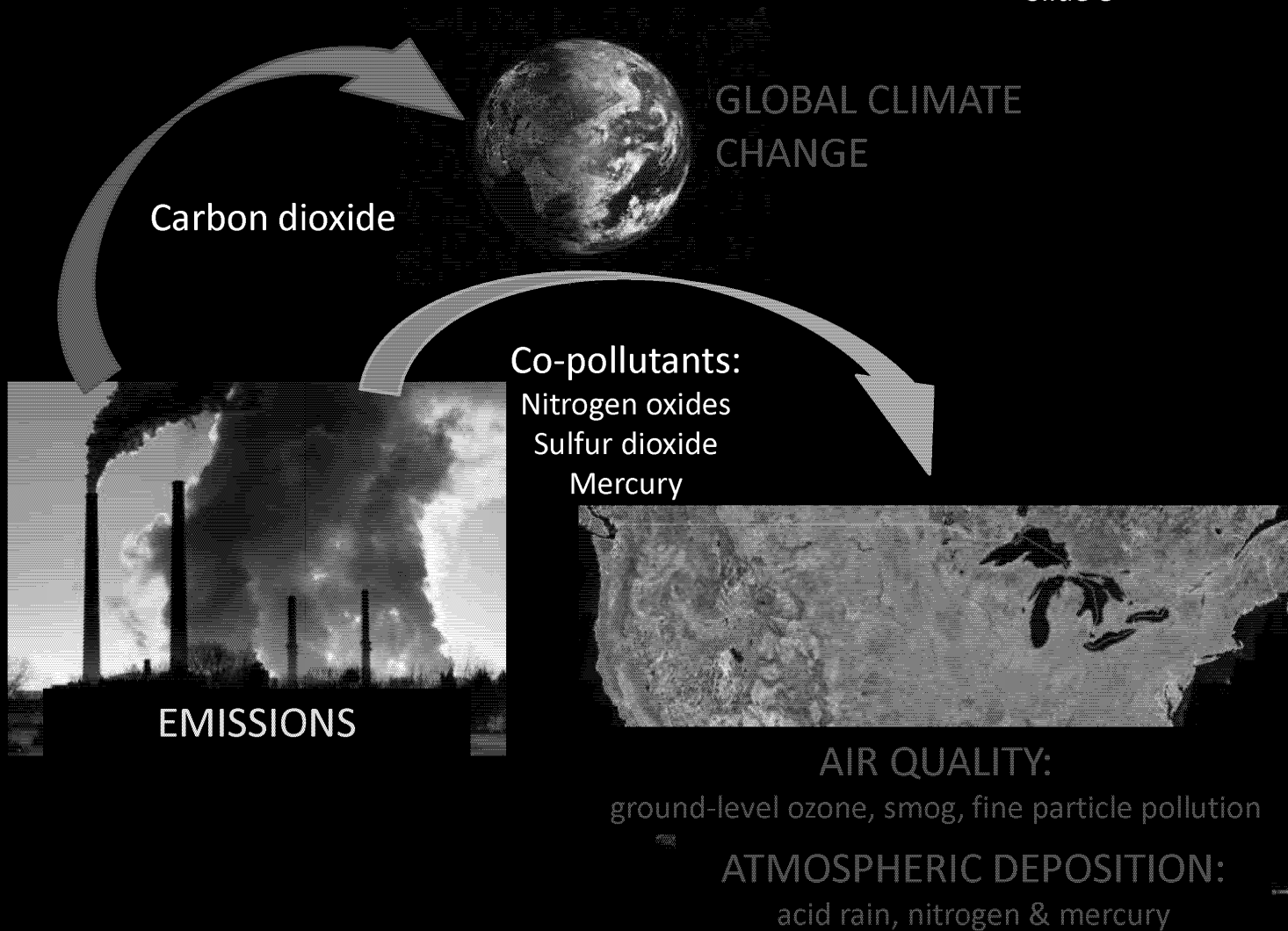


Key Findings

1. A strong carbon standard would decrease the emissions of multiple other pollutants that are harmful to people and the environment (e.g., SO₂, NO_x, mercury).
2. As a result of lower emissions, states would experience improved air quality (e.g., fine particles) and less “atmospheric deposition” of pollution (e.g., acid rain). All states would see benefits, with the greatest *average* improvements in: OH, PA, MD, WV, IL, KY, MO, IN, CO, AL, AR, DE.
3. A weaker standard limited to power plant retrofits “inside the fenceline” would bring little if any additional air quality benefits for states.
4. The results of our analysis suggest that stronger standards (in terms of both stringency and flexibility) result in greater and more widespread added benefits for people and the environment.

Why is this study important now?

- EPA carbon standards expected June 2, 2014
- Standards apply to existing power plants
- Based on section 111d of the Clean Air Act
- EPA issues guidelines and states develop plans to implement standards
- Guidelines are based on “Best System of Emissions Reduction” not a single numeric standard



Reference Case

- EIA 2013 Annual Energy Outlook determines energy demand
- All current air quality policies fully implemented:
 - Mercury and Air Toxics Standards (MATS)
 - Clean Air Interstate Rule
 - RGGI) model rule for emissions trading
 - CA Assembly Bill 32 (AB32) included
 - Regional haze rule included
- Wind power production tax credit (PTC) expires
- Nuclear units re-licensed, 20-year extension
- CO₂ emissions estimated to decrease by 15.2% from 2005 by 2020

Scenario 1: Power Plant Retrofit

- Low stringency, low flexibility
- Limited to compliance measures “inside the fenceline”
- Coal plants invest in on-site efficiency (heat rate) retrofits
- Or, satisfy equivalent CO₂ emission rate reduction through:
 - Co-fire or convert to natural gas or biomass
 - Combination of modest plant efficiency retrofit and co-firing
- Decreases CO₂ emissions by 17.4% from 2005, 2.2% from 2020 Reference Case by 2020

Scenario 2: Flexible Approach

- Moderate stringency, high flexibility
- Establishes benchmark emissions rate for each state
- Allows states many compliance options:
 - Power plant efficiency/heat rate upgrades
 - switching to renewables
 - Full end-user (demand-side) energy efficiency
- Also allows averaging and trading
- Decreases CO₂ emissions by 35% from 2005, 23% from 2020 Reference Case by 2020

Scenario 3: Modeled as “Carbon Tax”

- High stringency, moderate flexibility
- Requires supply-side measures that achieve CO₂ reductions up to a cost of \$43 per metric ton in 2020
- Compliance options:
 - plant efficiency, co-fire/conversions
 - dispatch changes to cleaner generation
 - *doesn't allow demand-side energy efficiency*
- Decreases CO₂ emissions by 49% from 2005, 39% from 2020 Reference Case by 2020

Charles Driscoll, Jr. , PhD Syracuse University

The Co-benefits of Carbon Standards Study

TODAY - Part 1

SUMMER - Part 2

LATE SUMMER - Part 3

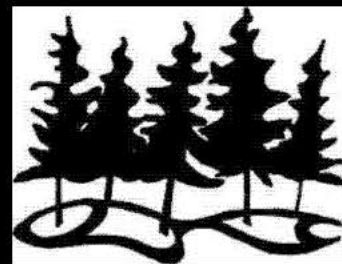
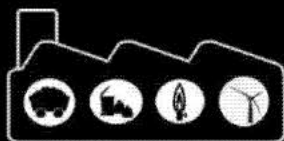
IPM
Power Sector
Analysis
&
Emissions
Estimates

CMAQ
Air Quality
Projections
&
Deposition
Estimates

BenMap
Human Health
Benefits

PnET-BGC
Acidification Benefits
Nitrogen Loads
Ozone benefits
Visibility
Improvements

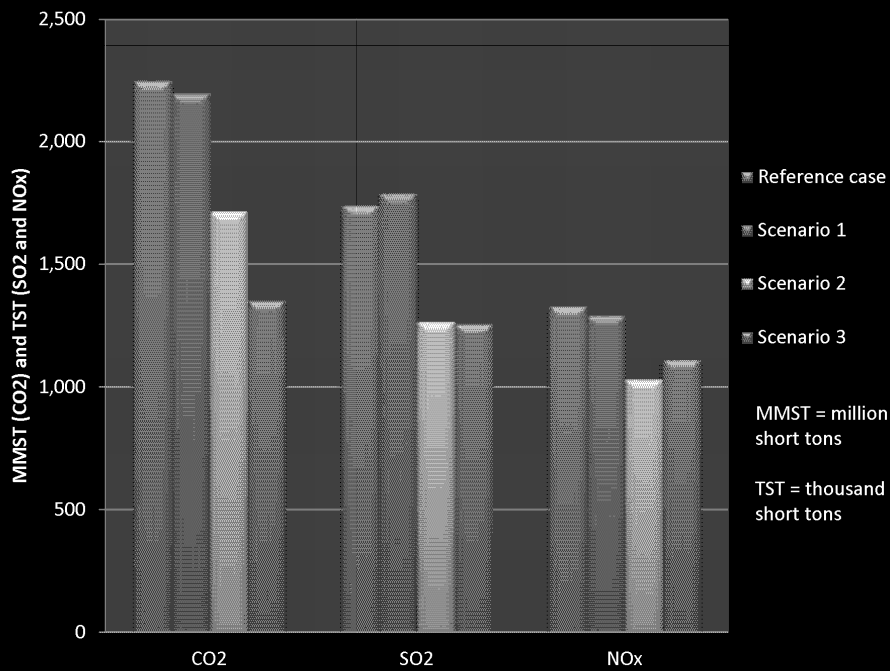
Assumptions:
Reference Case
Scenario 1: Plant Retrofits
Scenario 2: Flexible Approach
Scenario 3: "Carbon Tax"



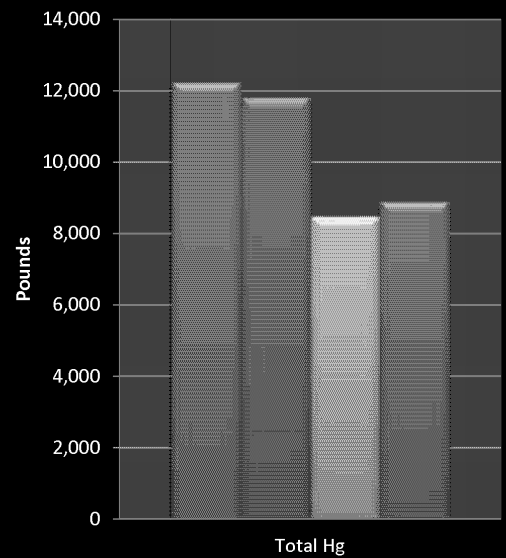
Finding #1

A strong carbon standard would decrease the emissions of multiple other pollutants that are harmful to people and the environment (e.g., SO₂, NO_x, mercury).

Annual Power Sector Emissions in 2020



Annual Power Sector Mercury Emissions in 2020



“Weaker” Standard = Scenario #1

- Decreases CO₂ by 2.2% from Reference Case by 2020
- *Increases* SO₂ by +3%
- Decreases NO_x by 3%

“Stronger” Standards = Scenarios #2, #3

- Decrease CO₂ by 23% to 39% from Reference Case by 2020
- Decrease SO₂ by 27%
- Decrease mercury by 27%
- Decrease NO_x by 16% to 22%

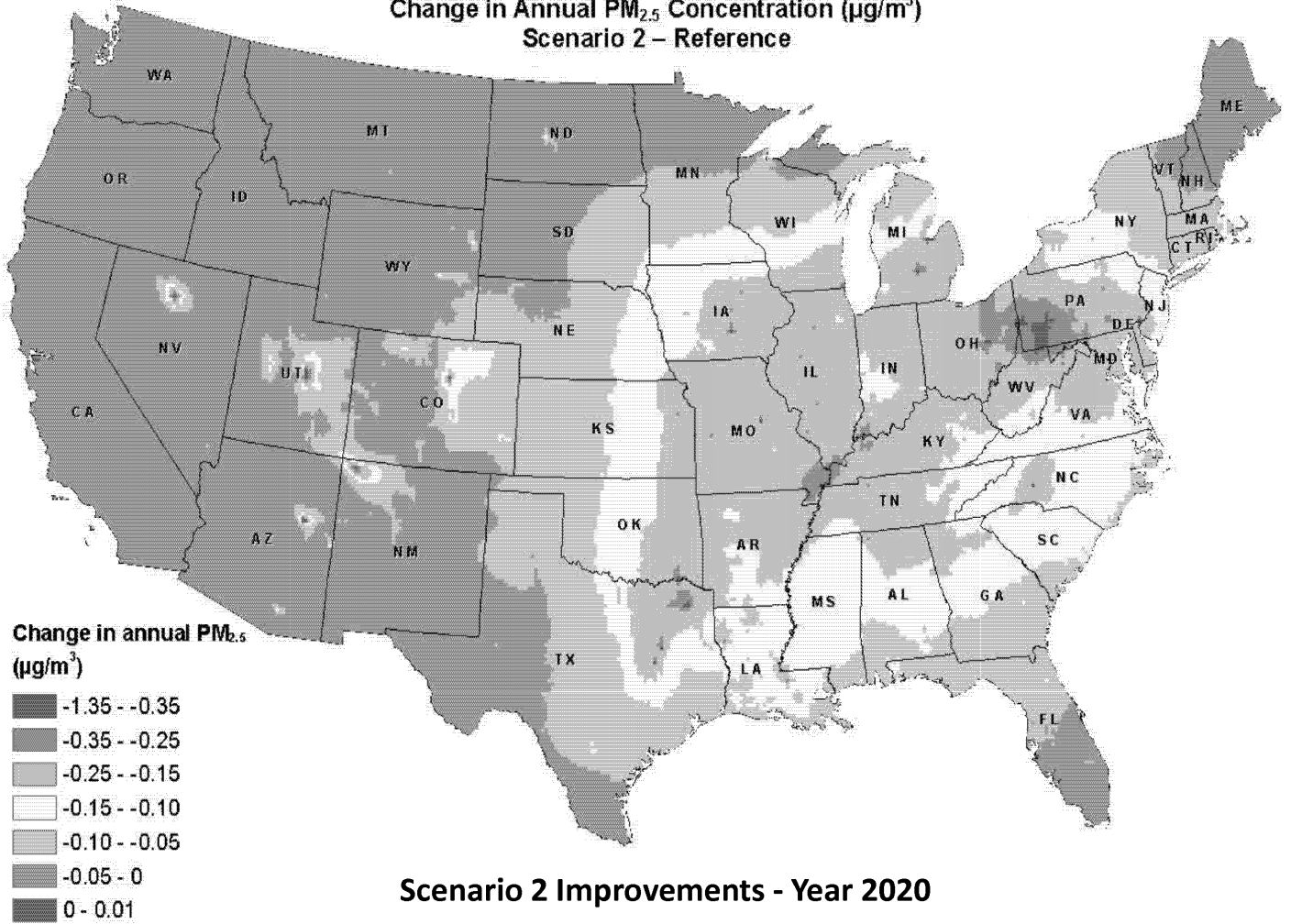
Performance Measures	SO ₂ +NO _x reduced/CO ₂ reduced (TST/MMST) ¹
Scenario 1	-0.22
Scenario 2	1.46
Scenario 3	0.84

Finding #2

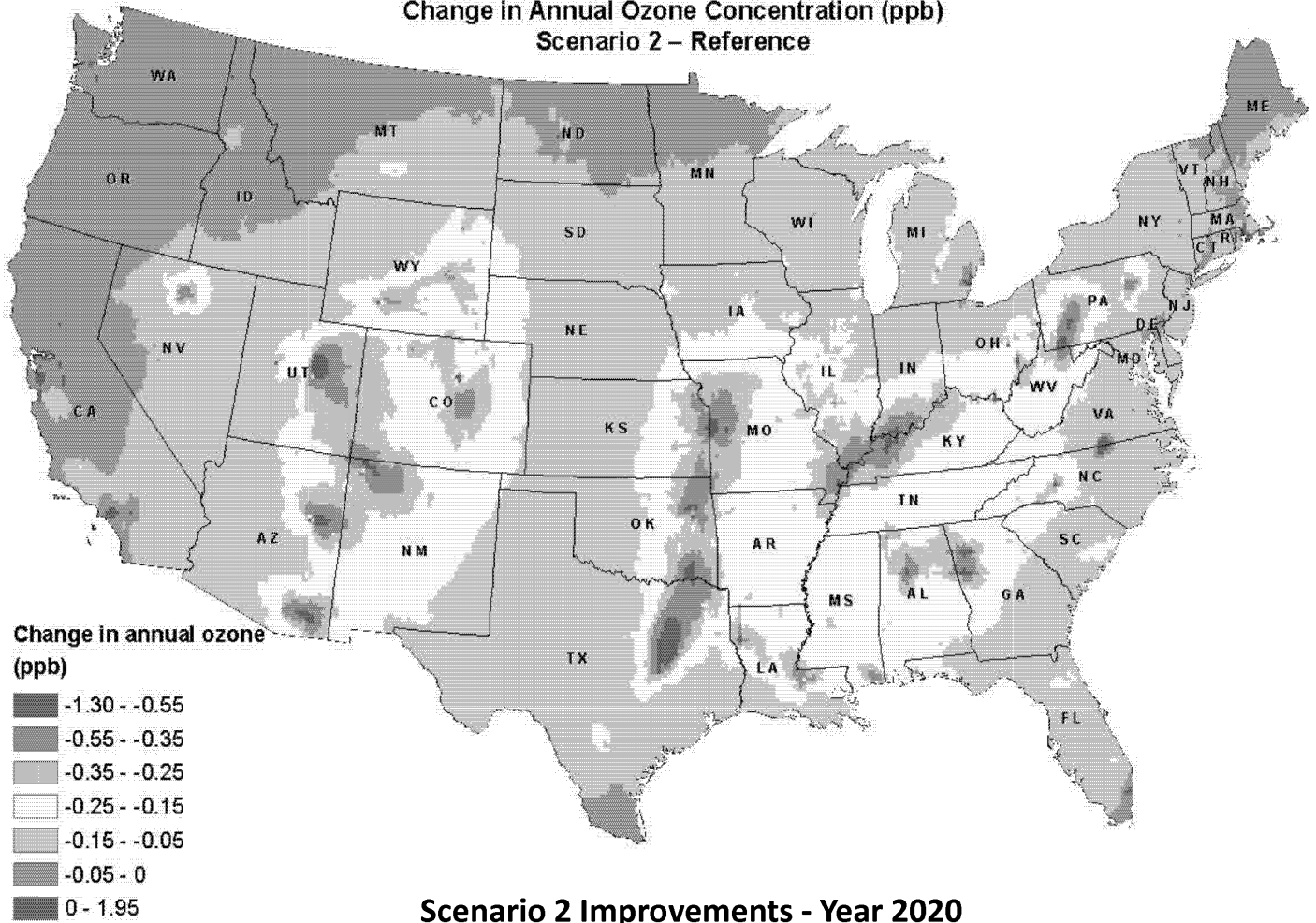
As a result of lower emissions, states would experience improved air quality (e.g., fine particles) and less “atmospheric deposition” of pollution (e.g., acid rain).

All states would see benefits, with the greatest *average* improvements in: OH, PA, MD, WV, IL, KY, MO, IN, CO, AL, AR, DE.

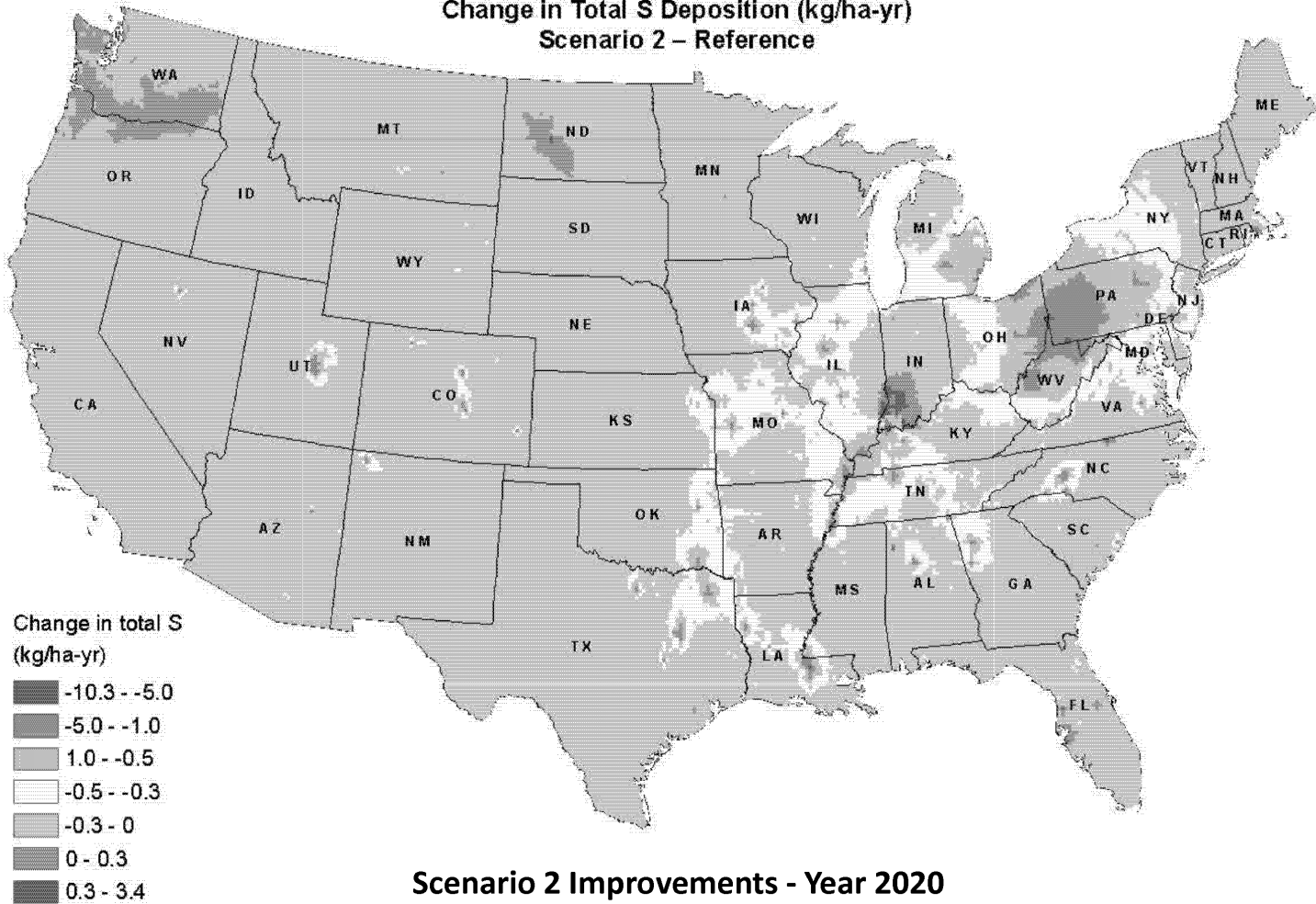
**Change in Annual PM_{2.5} Concentration (µg/m³)
Scenario 2 – Reference**



**Peak 8-hour Ozone
Change in Annual Ozone Concentration (ppb)
Scenario 2 – Reference**



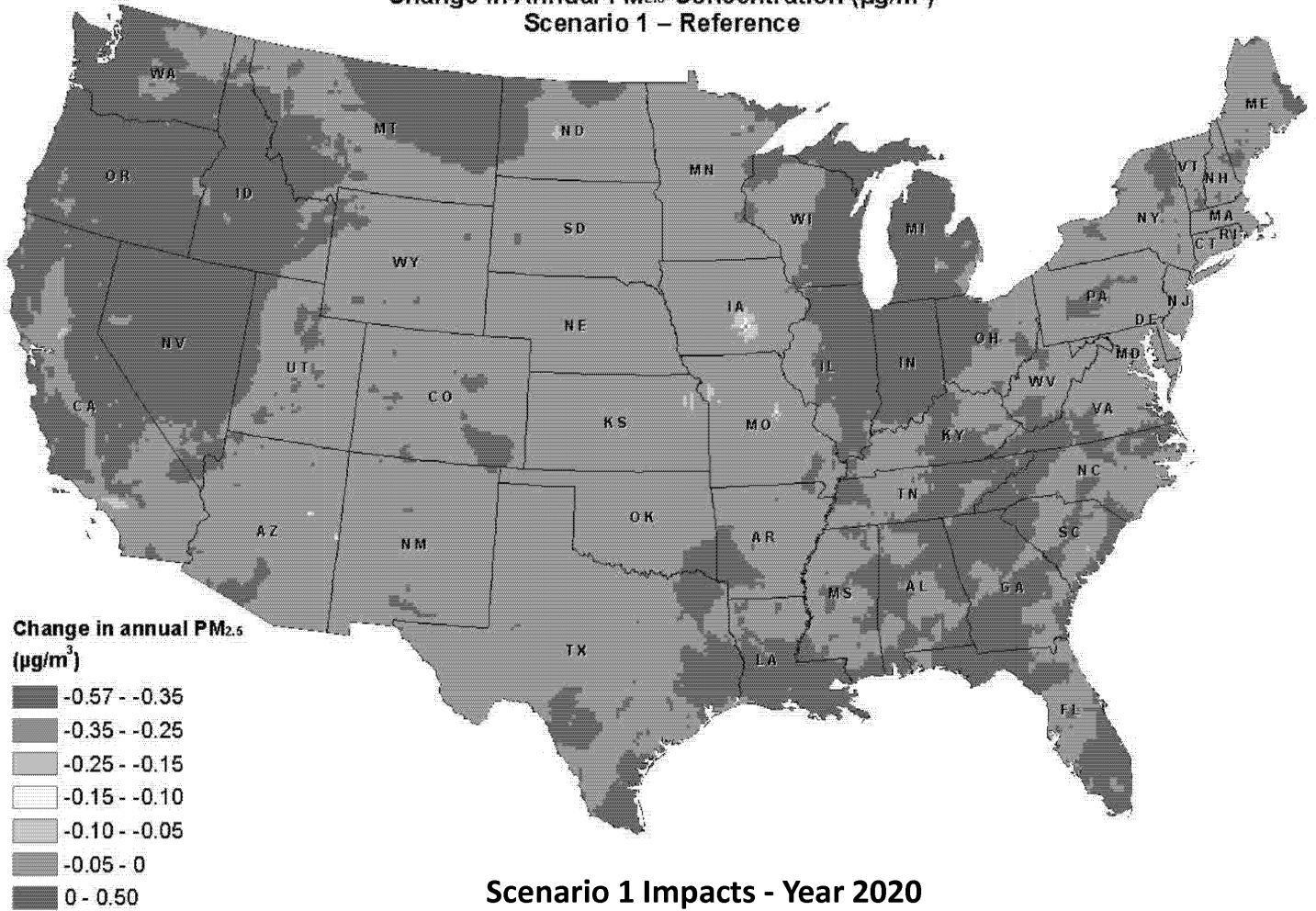
**Change in Total S Deposition (kg/ha-yr)
Scenario 2 – Reference**



Finding #3

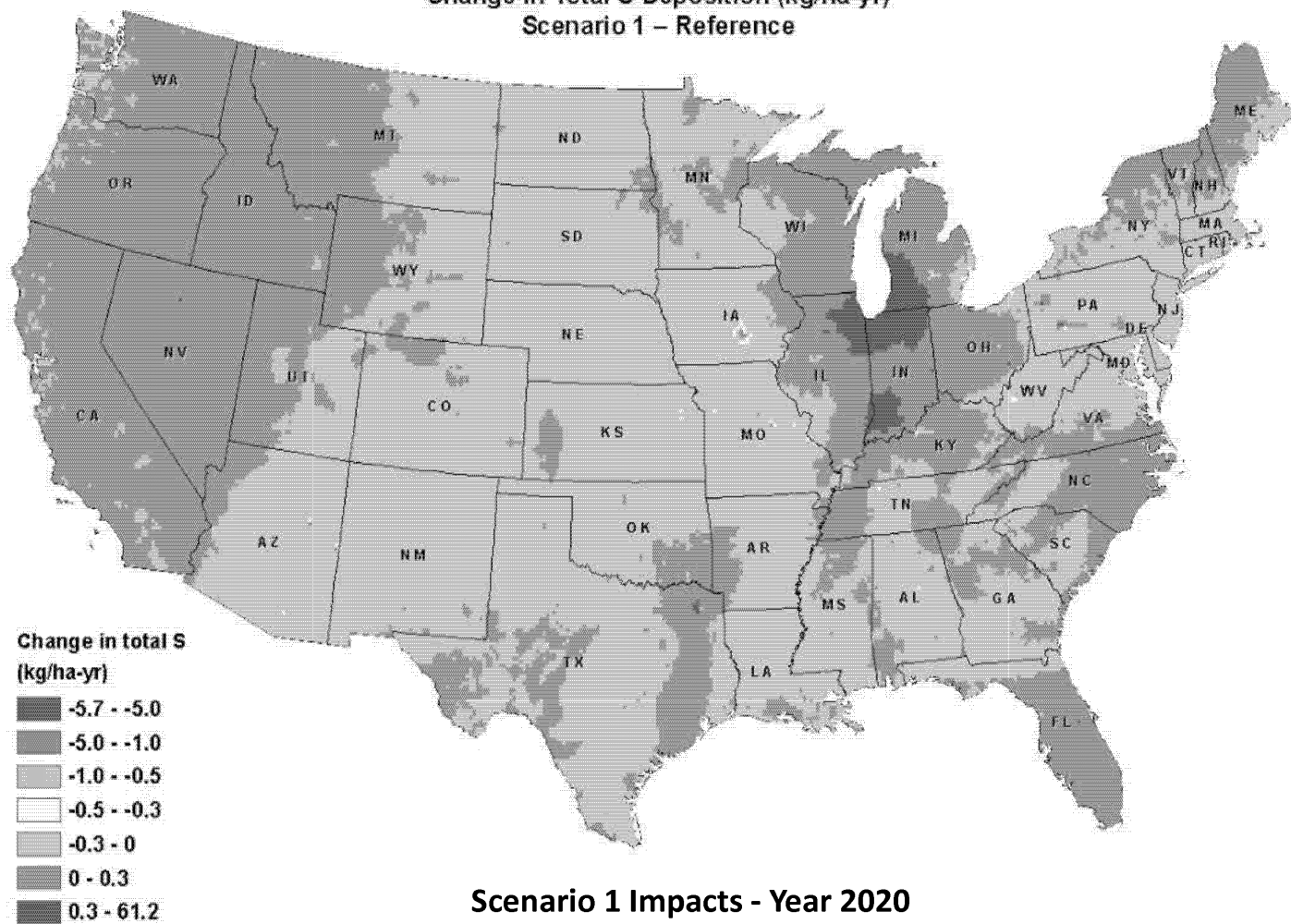
A weaker standard limited to power plant retrofits “inside the fenceline” would bring little if any additional air quality benefits for states.

Change in Annual PM_{2.5} Concentration ($\mu\text{g}/\text{m}^3$)
Scenario 1 – Reference



Scenario 1 Impacts - Year 2020

**Change in Total S Deposition (kg/ha-yr)
Scenario 1 – Reference**



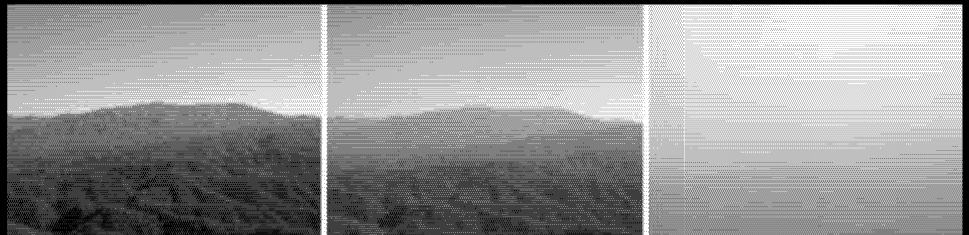
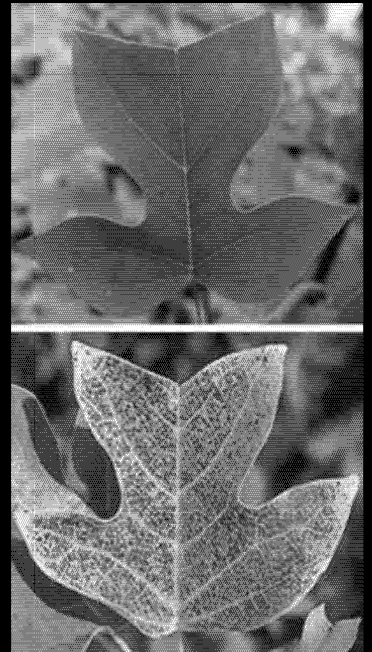
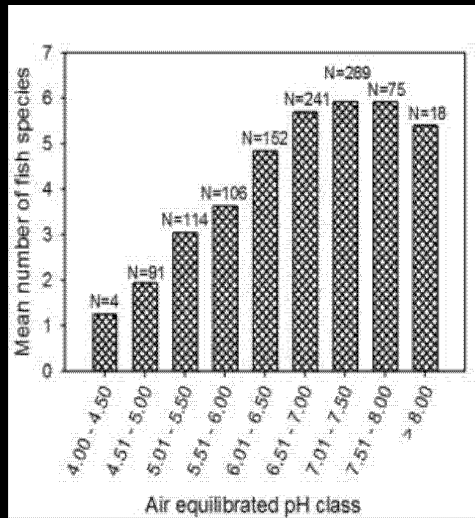
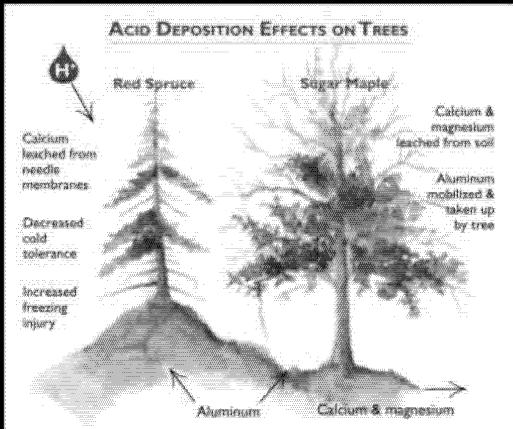
Finding #4

The results of our analysis suggest that stronger standards (in terms of both stringency and flexibility) result in greater and more widespread added benefits for people and the environment.

Gains from Lower Emissions of Other Harmful Pollutants

Parts 2 & 3 of this study

Ecosystem Benefits



Jonathan Buonocore, ScD Harvard School of Public Health

Public Health Effects - Summary of baseline cases (2005)

Fine particulate matter (PM_{2.5})

- 130,000 to 320,000 premature deaths
- 180,000 non-fatal heart attacks
- 200,000 hospital and emergency room visits
- 2.5 million asthma exacerbations
- 18 million lost days of work

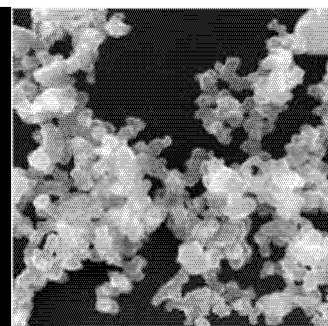
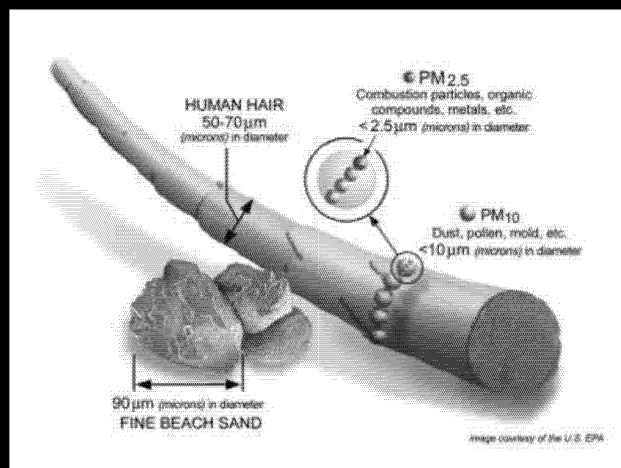
Ground-level ozone (O₃)

- 4,700 to 19,000 premature deaths
- 77,000 hospital admissions and emergency room visits
- 11 million school absence days

(Fann et al. 2012).

Fine Particle (PM_{2.5}) Health Effects

- Restricted activity days, lost work days, respiratory symptoms
- Hospital admissions and emergency department visits (asthma, cardiovascular, respiratory)
- Heart attacks
- Premature death



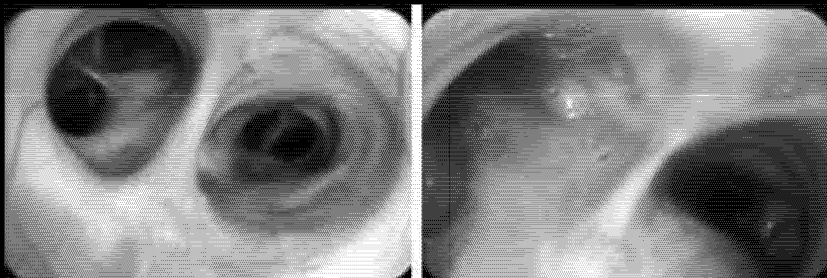
www.earthobservatory.nasa.gov

Ozone (O₃) Health Effects

- Respiratory symptoms, medication use, asthma attacks
- Doctor visits, school absences, restricted activity days
- Emergency department visits, hospital admissions (respiratory causes)
- Premature death



<http://blog.cookcountygov.com/>



www.epa.gov

Seemingly Small Air Quality Improvements Can Make a Big Difference for Public Health

- Example: U.S. EPA's Mercury and Air Toxics Rule
- Reduced annual average PM_{2.5} by 0.36 µg/m³ and annual average 8-hr ozone concentrations by 0.2 ppb.
- The estimated annual health benefits of this rule are:
 - 7,600 avoided premature mortality cases
 - 4,700 avoided non-fatal heart attacks
 - 130,000 avoided asthma attacks
 - 5,700 avoided hospital and emergency department visits
 - 540,000 fewer days of missed work or school
 - 3,200,000 fewer restricted activity days
- Health benefits were valued between \$120 and \$280 billion annually

Key Findings

1. A strong carbon standard would decrease the emissions of multiple other pollutants that are harmful to people and the environment (e.g., SO₂, NO_x).
2. As a result of lower emissions, states would experience improved air quality (e.g., fine particles) and less “atmospheric deposition” of pollution (e.g., acid rain). All states would see benefits, with the greatest *average* improvements in: OH, PA, MD, WV, IL, KY, MO, IN, CO, AL, AR, DE.
3. A weaker standard limited to power plant retrofits “inside the fenceline” would bring little if any additional air quality benefits for states.
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Q & A

- To ask a question, please unmute your line by pressing *6
- Please give your name and affiliation
- After asking your question, please re-mute your line by pressing *6

Thank You

Questions:

alexandra@spitfirestrategies.com or 202-448-0202

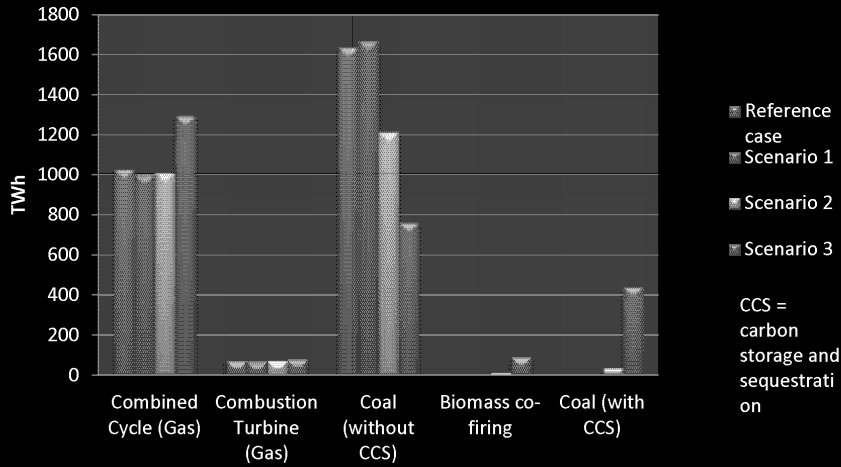
klambert01@fas.harvard.edu or 802-436-4507

Find the report and slides on the web:

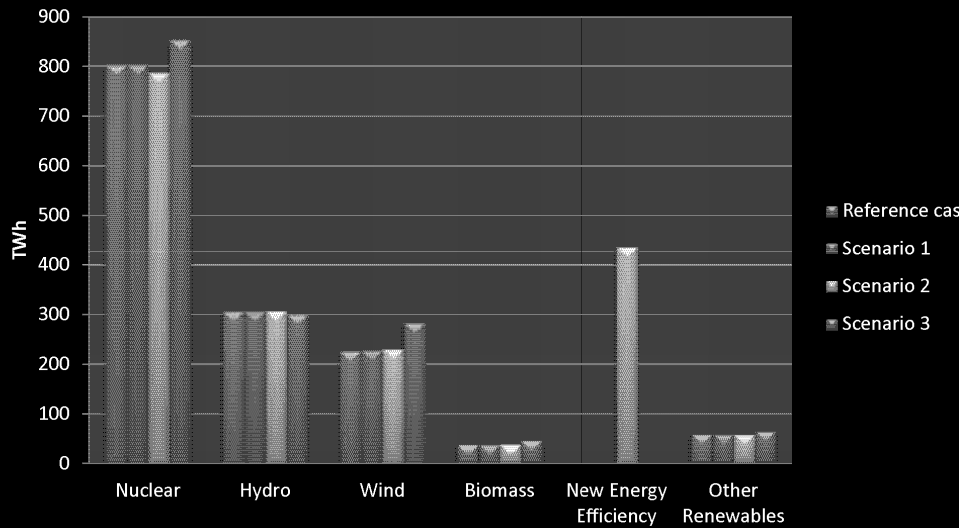
eng-cs.syr.edu/carboncobenefits

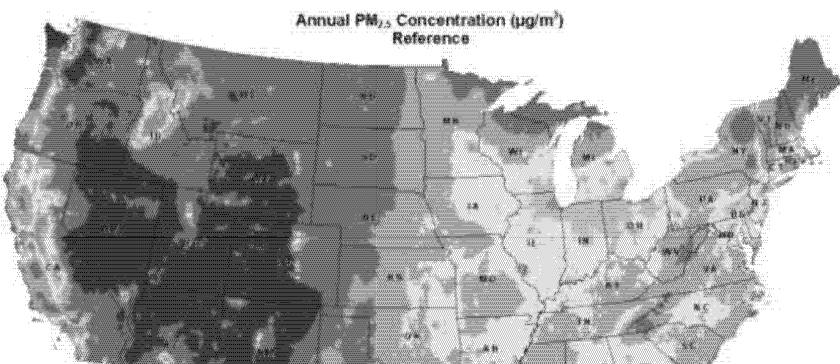
Back pocket slides

Fossil Fuel Generation in 2020



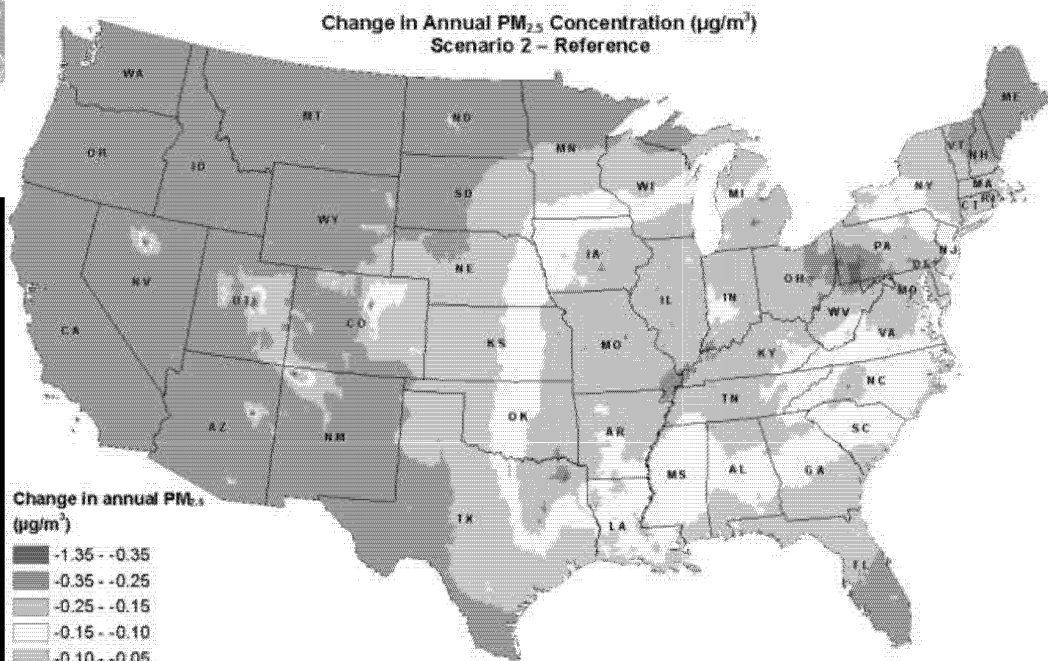
Renewable Generation and Efficiency in 2020





Annual $PM_{2.5}$
($\mu\text{g}/\text{m}^3$)

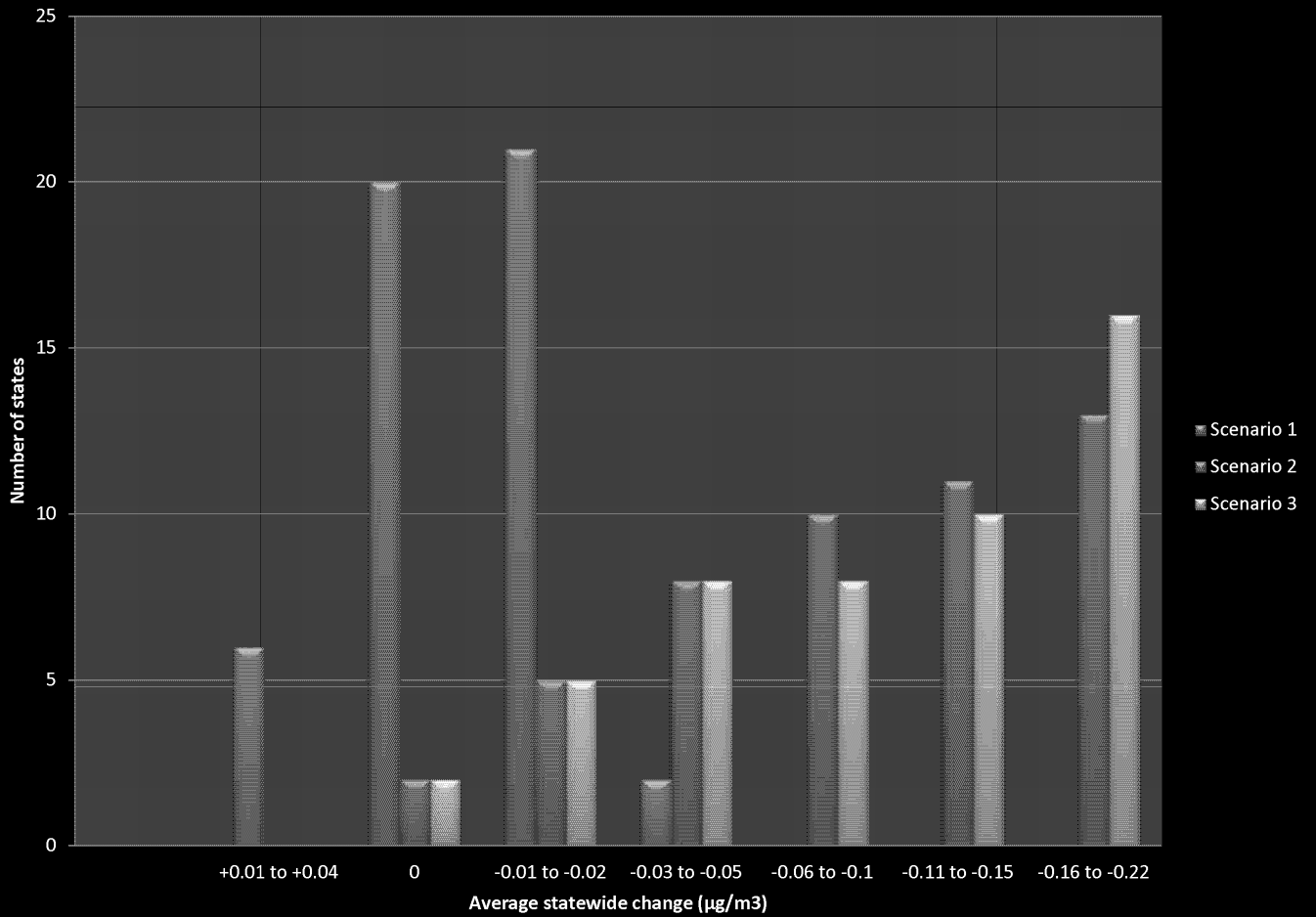
1 - 2
2 - 4
4 - 6
6 - 8
8 - 10
10 - 20
20 - 46

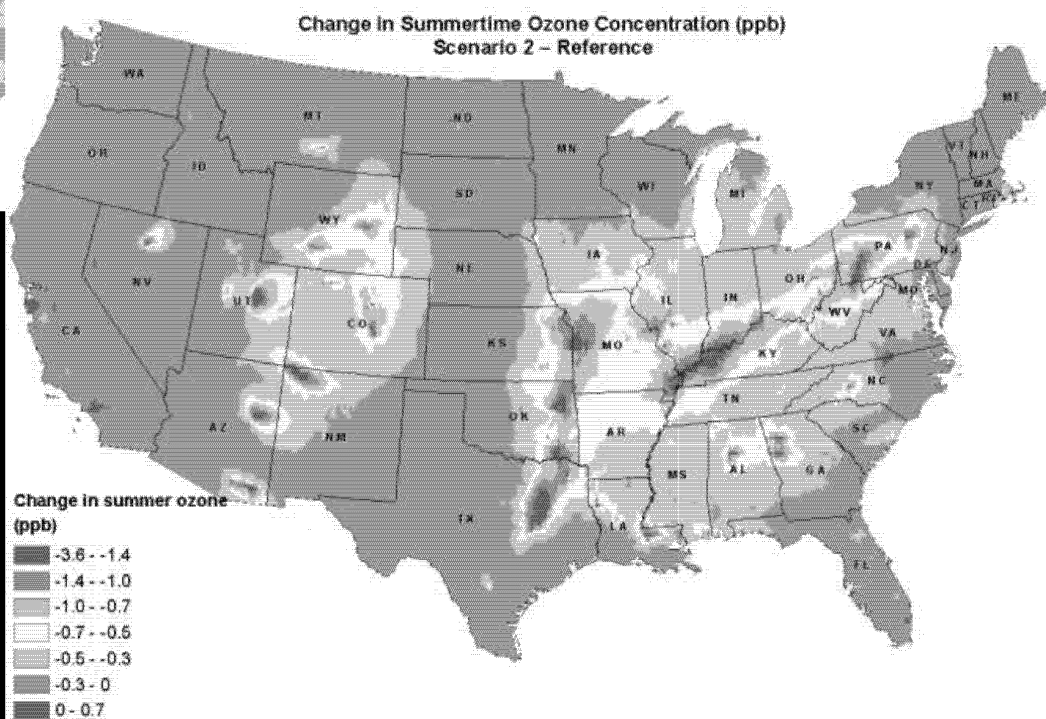
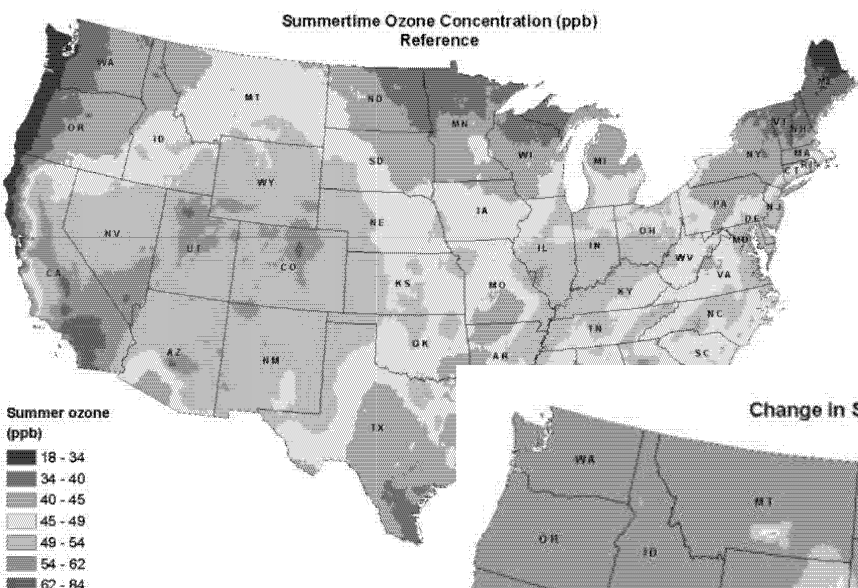


Change in annual $PM_{2.5}$
($\mu\text{g}/\text{m}^3$)

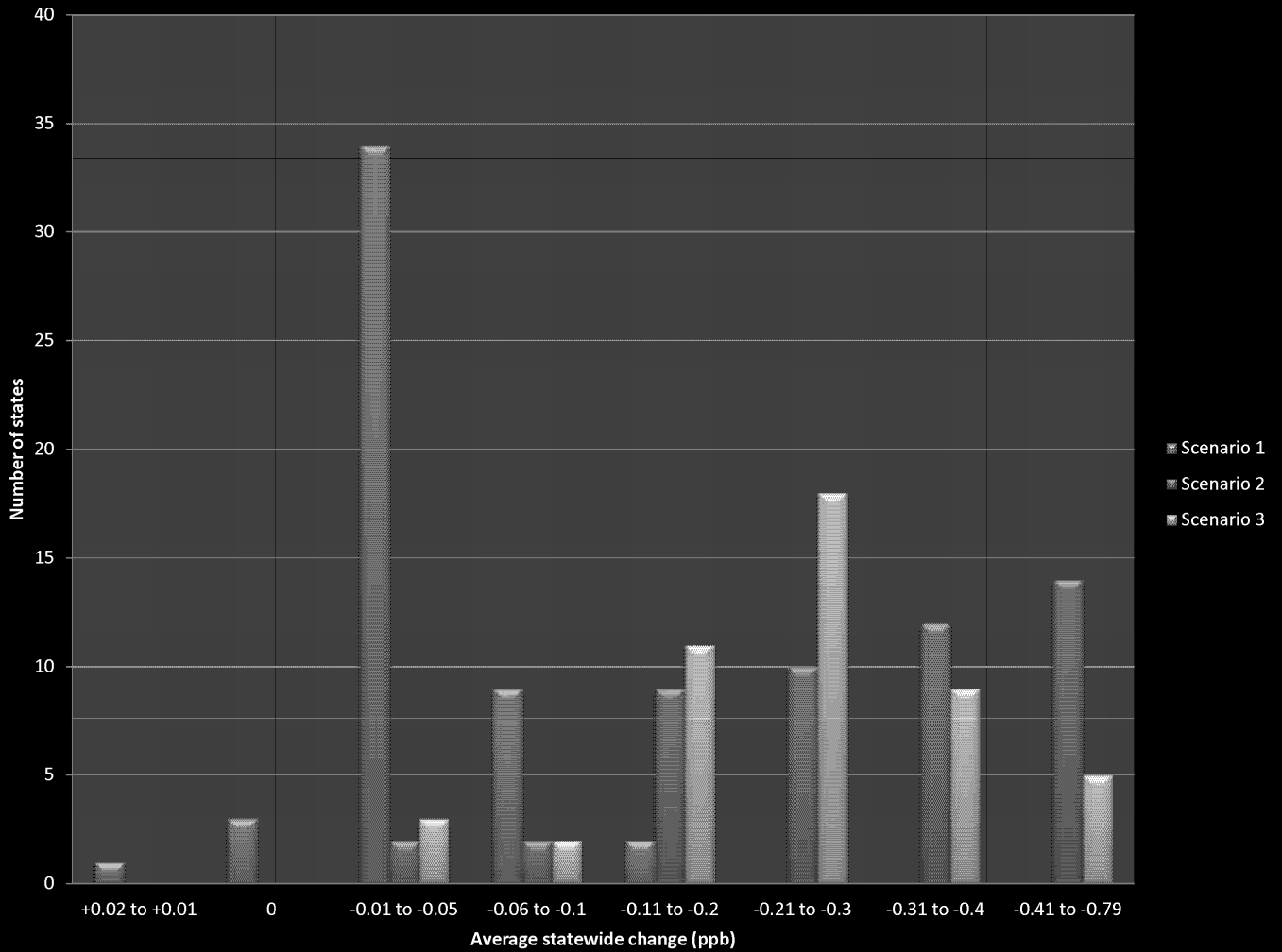
-1.35 - -0.35
-0.35 - -0.25
-0.25 - -0.15
-0.15 - -0.10
-0.10 - -0.05
-0.05 - 0
0 - 0.01

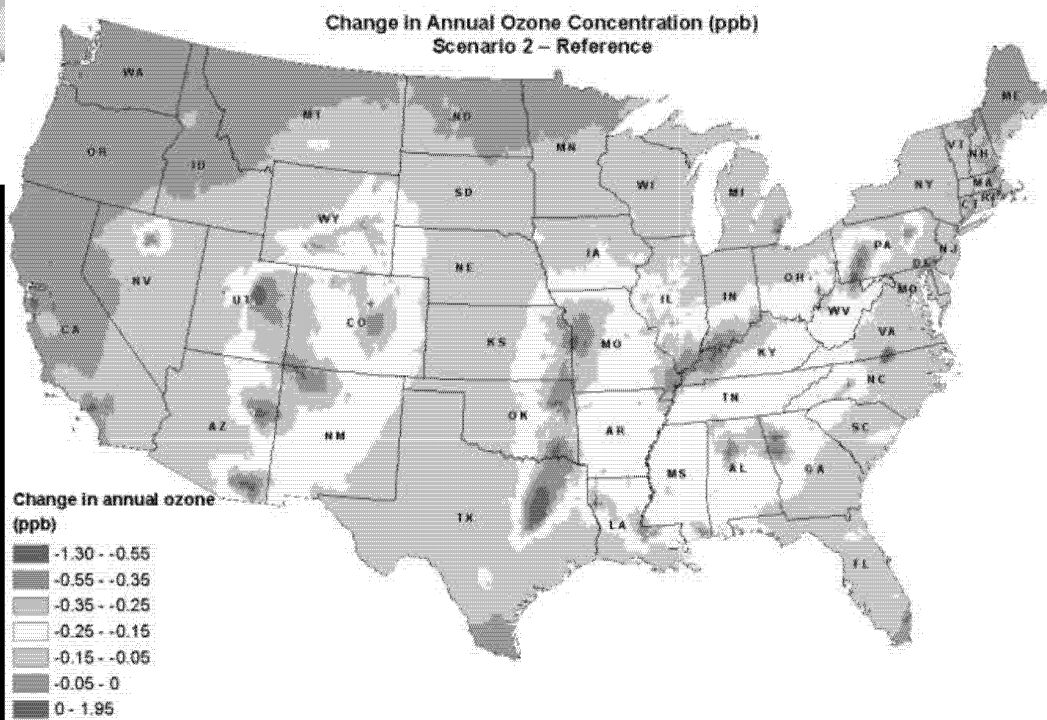
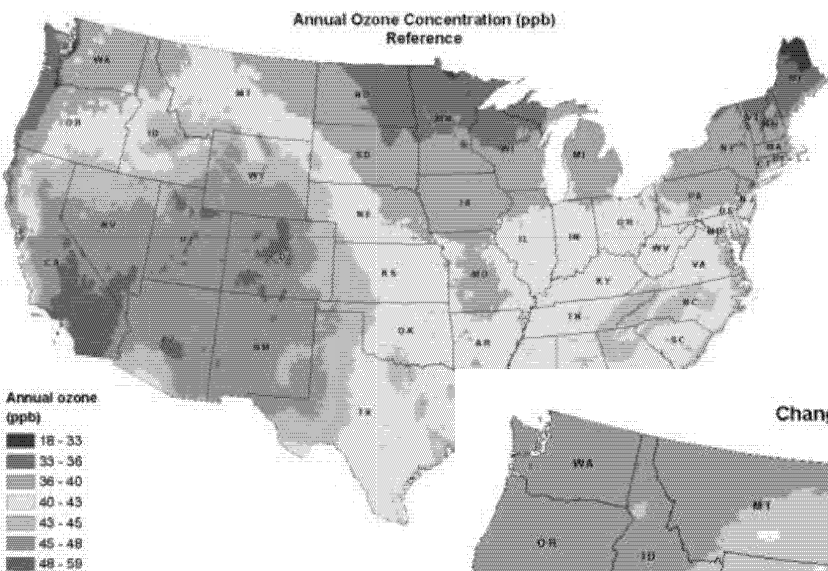
State-level Changes in Average Annual PM_{2.5} in 2020





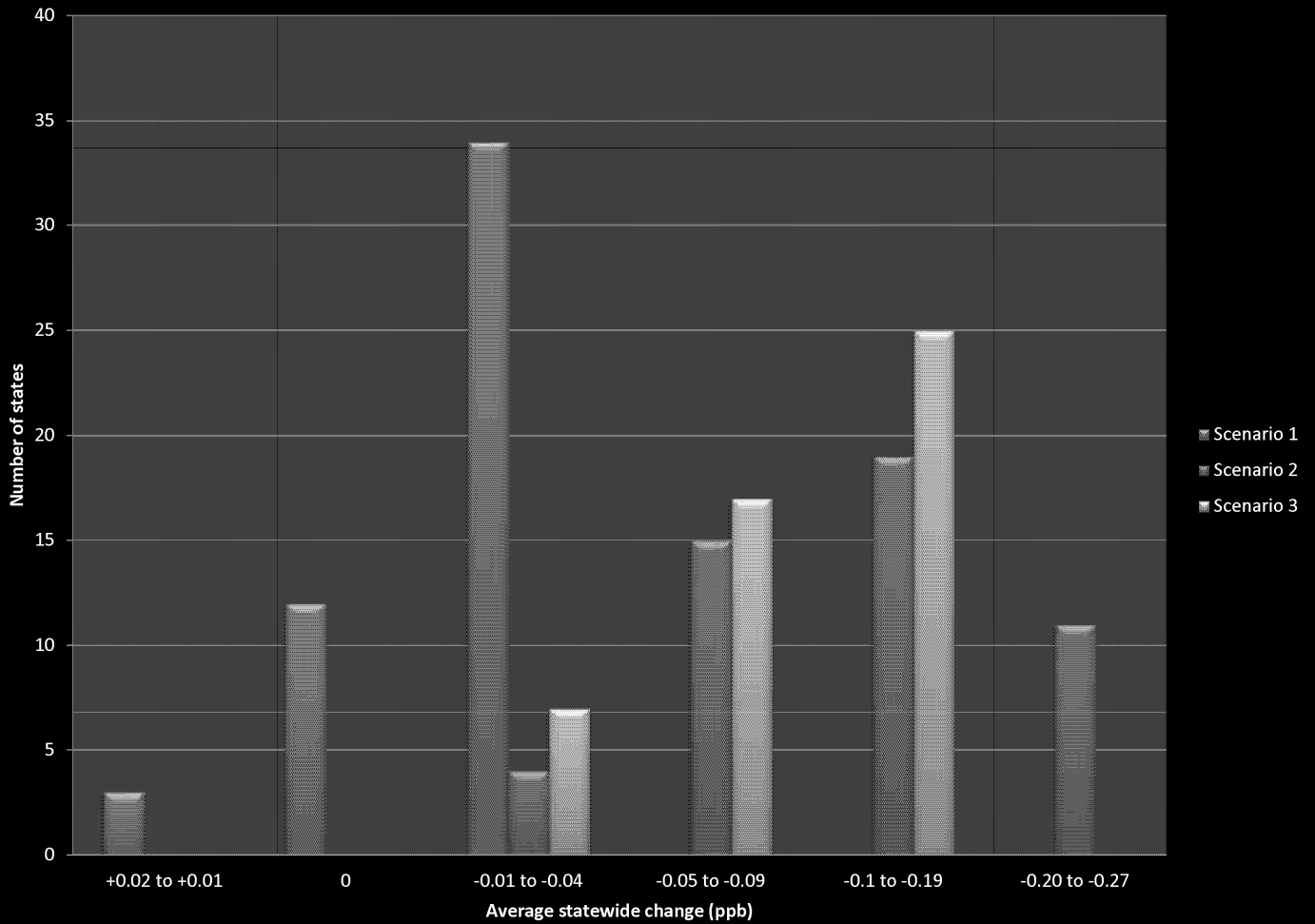
State-level Changes in Summer Peak 8-hour Ozone in 2020

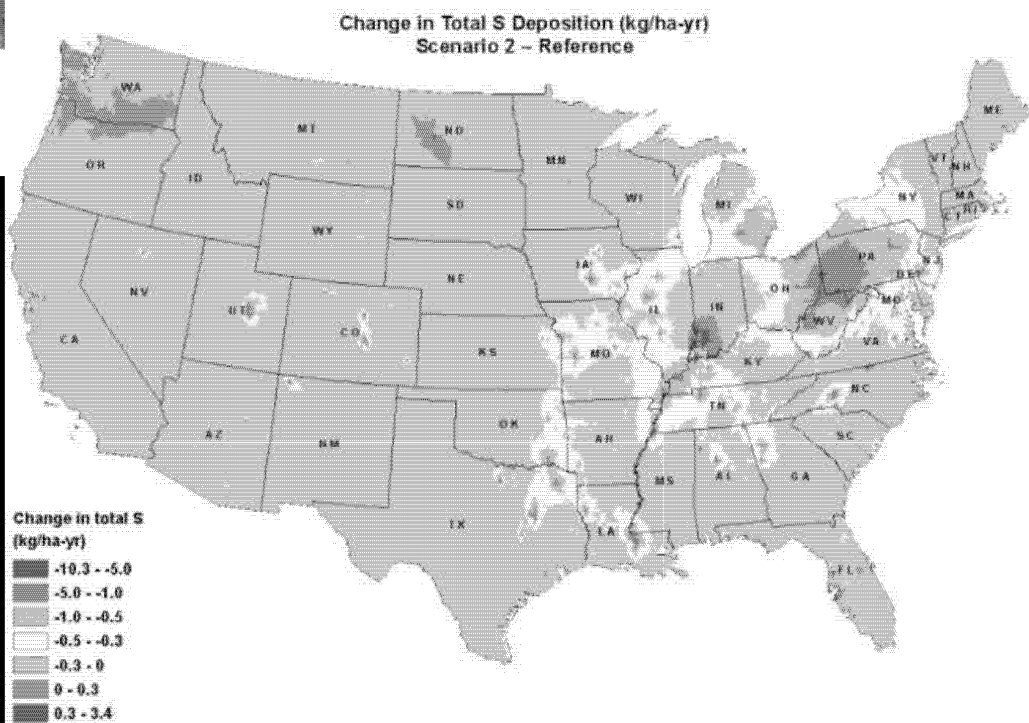
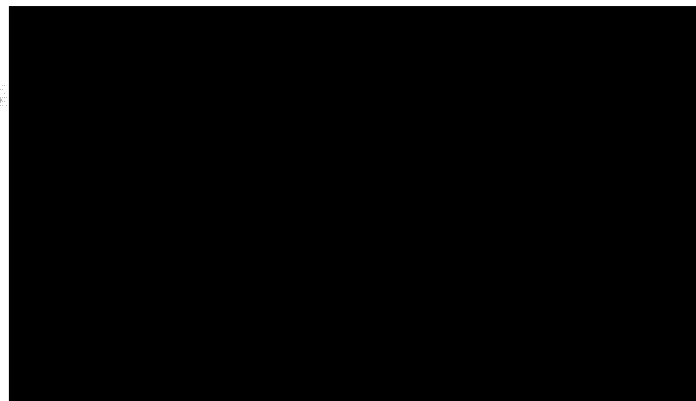
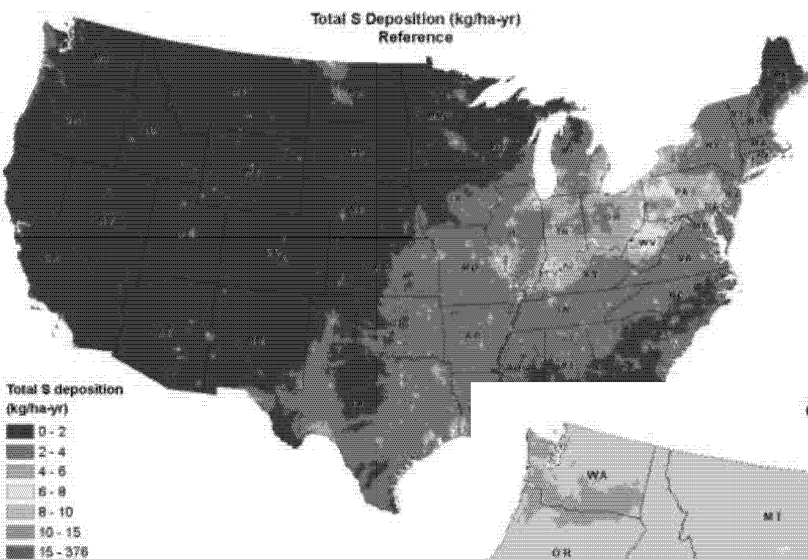




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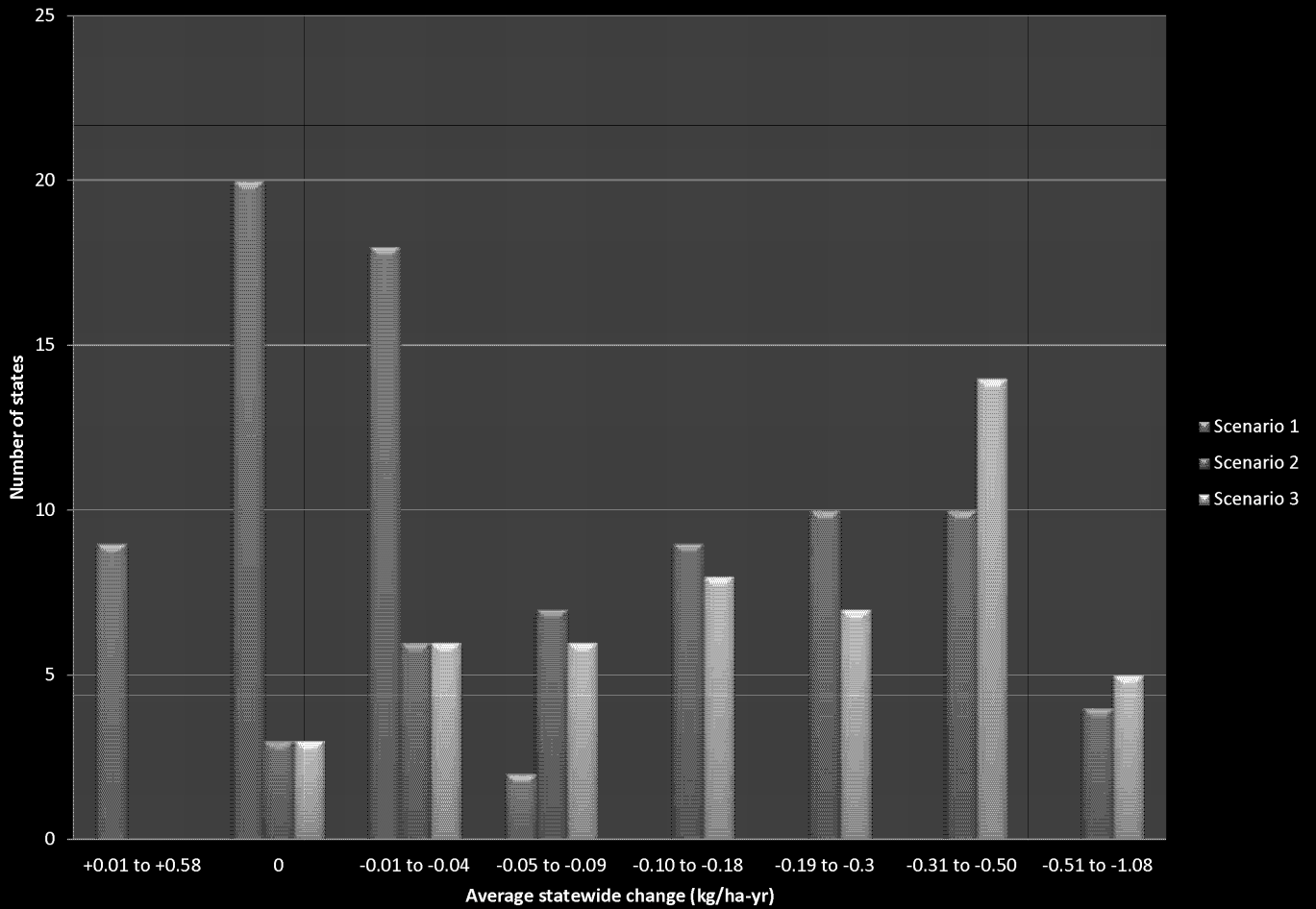
State-level Changes in Average Annual Peak 8-hr Ozone in 2020

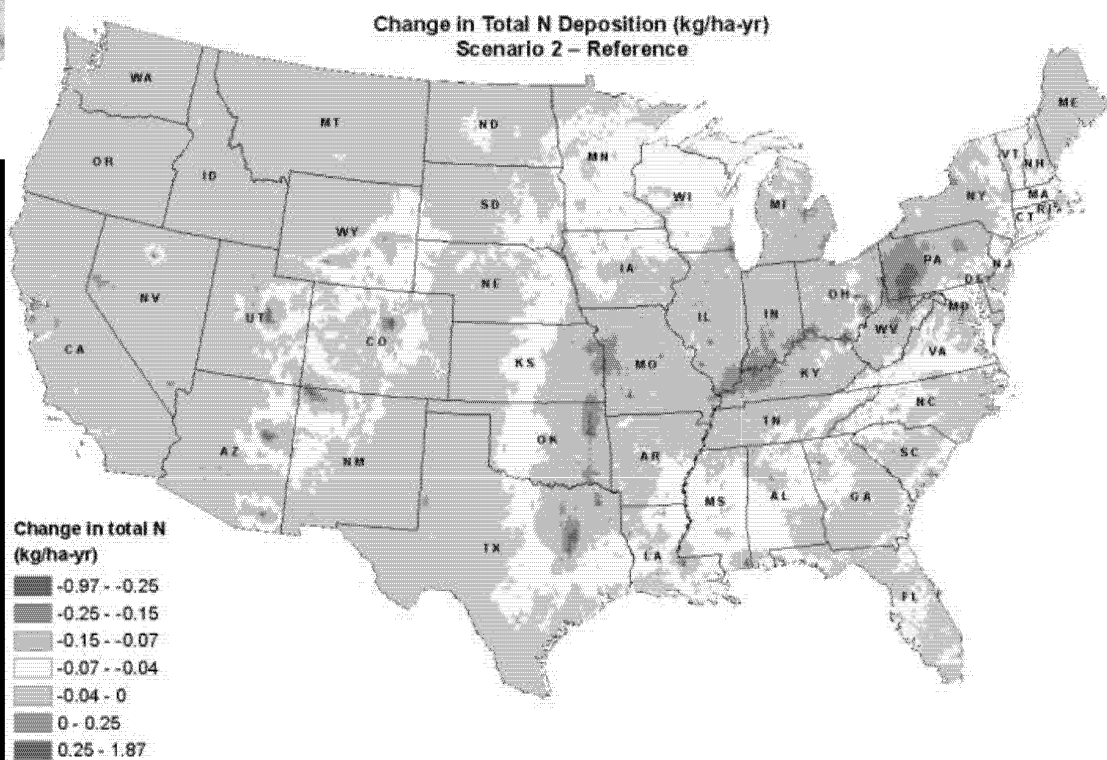
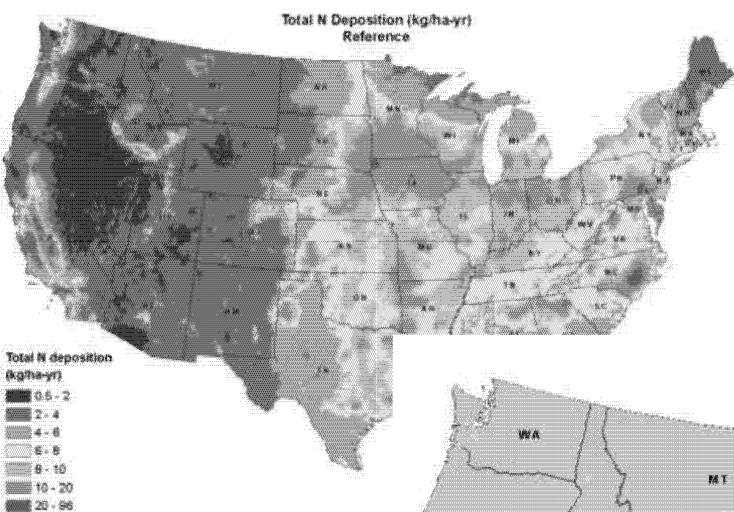




ED_000419-0000337

State-level Changes in Total Sulfur Deposition in 2020





ED_000419-0000339

From: Noe, Paul
To: Goffman, Joseph
CC: Browne, Cynthia; Missimer, Katie
Sent: 4/24/2014 8:08:09 AM
Subject: White Paper: Legal Justification for Forest Products Manufacturing Residuals
Attachments: Justification for exempting residuals 041514 FINAL.PDF

Dear Joe: Can we set a time to meet with you, OGC, et al to discuss our white paper on EPA's legal authority to exempt biogenic CO2 emissions from forest products manufacturing residuals?

Best regards,

Paul

Paul Noe

Vice President for Public Policy

Paul.No@afandpa.org

(202) 463-2777

AMERICAN FOREST & PAPER ASSOCIATION

1101 K Street, N.W., Suite 700

Washington, D.C. 20005



From: Missimer, Katie **On Behalf Of** Noe, Paul

Sent: Tuesday, April 15, 2014 10:55 AM

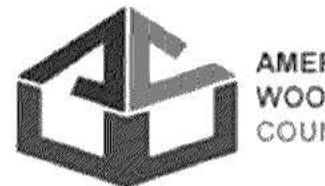
To: Goffman.joseph@Epa.gov

Cc: Gunning.paul@Epa.gov; Ohrel.sara@Epa.gov; Santiago.juan@Epa.gov; Tsang, Linda; Hunt, Tim; Lancey, Stan; Glowinski, Robert

Subject: White Paper: Legal Justification for Forest Products Manufacturing Residuals



**American
Forest & Paper
Association**



April 15, 2014

Dear Joe:

The attached white paper discusses the legal bases for EPA to exempt from Prevention of Significant Deterioration (PSD) permitting biogenic CO2 emissions from forest products manufacturing residuals. It sets forth in detail how judicial precedent and past EPA actions defining the scope of the PSD permitting program allow, and indeed compel, EPA to differentiate between biogenic CO2 emissions and CO2 emissions generated by combustion of fossil fuels.

Please contact me if you have any questions.

Thank you.

CC:

Paul Gunning

Sara Ohrel

Juan Santiago

Linda Tsang

Tim Hunt

Stan Lancey

Robert Glowinski

Paul Noe

Vice President for Public Policy

Paul_Noe@afandpa.org

(202) 463-2777

AMERICAN FOREST & PAPER ASSOCIATION

AMERICAN WOOD COUNCIL

1101 K Street, N.W., Suite 700

Washington, D.C. 20005



From: Dave Tenny
To: Goffman, Joseph
CC: Chip Murray
Sent: 4/18/2014 9:46:10 AM
Subject: Latest version of NCASI white paper on average carbon per acre approach
Attachments: bafReport4RegionsDraft2.pdf

Hi, Joe – here is the last draft of the work NCASI did that Al Lucier presented to you. I believe you all received an earlier version of this. The attached draft is the last version we had prior to Al's untimely passing.

We are working to get a final version of this. Pending that, this document is near final and will hopefully be a good reference for your team. I look forward to talking with you later today.

Dave

David P. Tenny
President and CEO
National Alliance of Forest Owners
122 C Street, NW, Suite 630
Washington, D.C. 20001
Office: (202) 747-0739
Fax: (202) 824-0770
Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Dave Tenny
To: Goffman, Joseph
CC: Browne, Cynthia; Chip Murray; Karisa Smith
Sent: 3/7/2014 6:15:49 PM
Subject: Materials for Monday's Meeting
Attachments: Draft - NAFO Legal Authority White Paper 3.7.14.doc; FORISK US_Bioenergy_Markets FINAL 6-2013.pdf; NAFO Wood Bioenergy_Forestland Owners FINAL 20140212.pdf; Regional Approach to BCA Using FIA Data.pptx

Hi, Joe – thanks for the good meeting today. Attached are the following read ahead materials for Monday's meeting:

1. Updated legal/administrative record analysis (fixing the typos Roger mentioned)
2. NCASI slides on carbon per acre method for determining BAF's
3. FORISK white paper on biomass consumption and landowner behaviors (this is the one I already sent you, but I am including it here for convenience)
4. FORISK white paper on bioenergy markets (this is the paper I referenced today addressing some of the RPA predictions)

Our plan is to split the meeting time between the first two attachments with about 10 min. of presentation for each followed by Q&A. I will reference attachments 3 and 4 during the meeting much like I did today, but we won't dwell on them.

Thanks, Joe. Have a great weekend.

Dave

David P. Tenny
President and CEO
National Alliance of Forest Owners
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Fax: (202) 824-0770
Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Dave Tenny
To: Goffman, Joseph
CC: Browne, Cynthia; Karisa Smith; Chip Murray; Dan Sakura
Sent: 3/6/2014 10:38:52 AM
Subject: Read Ahead for Tomorrow
Attachments: Legal Authority Administrative Record Crosswalk White Paper 3 6 14.doc

Hi, Joe – attached is a read ahead for our meeting tomorrow. You have already seen the legal portions of the document. The new material (beginning with section IV) is the crosswalk with the administrative record. We look forward to seeing you tomorrow.

Dave

*David P. Tenny
President and CEO
National Alliance of Forest Owners
122 C Street, NW, Suite 630
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Office: (202) 747-0739
Fax: (202) 824-0770
Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org*

From: Goffman, Joseph
To: Culligan, Kevin; Tsirigotis, Peter
Sent: 3/7/2014 9:45:57 AM
Subject: FW: Read Ahead for Tomorrow
Attachments: Legal Authority Administrative Record Crosswalk White Paper 3 6 14.doc

From: Dave Tenny [mailto:dtenny@nafoalliance.org]
Sent: Thursday, March 06, 2014 10:39 AM
To: Goffman, Joseph
Cc: Browne, Cynthia; Karisa Smith; Chip Murray; Dan Sakura
Subject: Read Ahead for Tomorrow

Hi, Joe – attached is a read ahead for our meeting tomorrow. You have already seen the legal portions of the document. The new material (beginning with section IV) is the crosswalk with the administrative record. We look forward to seeing you tomorrow.

Dave

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Office: (202) 747-0739
Fax: (202) 824-0770
Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Dave Tenny
To: Goffman, Joseph
Sent: 3/12/2014 9:55:39 AM
Subject: FW: Three reasons why it's time to get the policy right on biomass energy carbon accounting

Hi, Joe – I thought this posting might be helpful in your preparation for tomorrow.

Dave

David P. Tenny
 President and CEO
 National Alliance of Forest Owners
 122 C Street, NW, Suite 630
 Washington, D.C. 20001
 Office: (202) 747-0739
 Fax: (202) 824-0770
 Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Gretchen Schaefer [<mailto:gschaefer@nafoalliance.org>]
Sent: Tuesday, March 11, 2014 3:21 PM
To: Dave Tenny
Subject: Three reasons why it's time to get the policy right on biomass energy carbon accounting



National Alliance of Forest Owners
Investing in the Future of America's Forests

A blog from Dave Tenny, NAFO President and CEO, March 11, 2014

Three reasons why it's time to get the policy right on biomass energy carbon accounting

The clock is ticking on the Environmental Protection Agency's (EPA) efforts to develop a workable carbon accounting approach for biomass energy greenhouse gas (GHG) emissions. Nearly three years ago the agency committed to complete by this July a final rule on biomass to address problems arising from the June 2010 "Tailoring Rule," which for the first time treated biomass carbon emissions the same as fossil fuel emissions.

The Tailoring Rule disregarded the fact that trees and other plants recycle atmospheric carbon. After hearing concerns from NAFO and allied organizations, the science community, members of Congress and other policy makers EPA decided to defer the Rule's treatment of biomass emissions for three years while the agency revisited the treatment of biomass.

During the intervening time the legal picture surrounding the Tailoring Rule has become murky. Last month, the Supreme Court heard oral argument on a petition challenging the validity of the Rule. In June the Court will render its decision. The outcome is uncertain, and the future of the Tailoring Rule hangs in the balance.

This uncertainty should not deter EPA from adopting a final biomass energy carbon accounting

framework within the timeframe the agency established. In fact, agency action to recognize the carbon benefits of biomass energy in a clear, simple and binding way is needed now more than ever for at least three reasons.

Removing investment uncertainty. As it stands those who are interested in building, modifying or converting existing facilities as well as those who acted in good faith on the EPA deferral rule are still in limbo. The question mark hovering over investment decisions is whether federal policy will treat biomass as a low carbon energy solution, a regulated source or something in the middle that is complicated to determine. The only way to overcome this uncertainty is for EPA to adopt a policy that clearly and simply establishes that biomass is a low carbon energy solution.

Clarifying the role of biomass in federal energy policy. EPA has several policy irons in the fire with respect to energy and GHG emissions. Several of these, like the Tailoring Rule and the forthcoming New Source Performance Standards for coal fired facilities, provide compliance options to energy producers to meet emissions requirements. Unless EPA adopts a clear and simple biomass accounting framework to plug into these policies, biomass will not be a compliance option. This tilts the playing field against biomass not only with respect to EPA's GHG regulations, but also with respect to its role in any "all of the above" energy strategy.

Promoting the carbon mitigation benefits of private forests. The President's Climate Action Plan asserts that working forests are part of the climate change solution and looks to these forests to provide important climate change mitigation benefits. Continued ambivalence regarding the role of biomass as a low carbon energy solution distracts significantly from this message and confuses the role of forests in the President's plan. Strong new and existing markets for forest products have helped produce 50 percent more total tree volume in the U.S. since the 1950s and now contribute to the removal of 14-15 percent of our nation's annual CO₂ emissions. A strong mitigation strategy for forests must include clear market signals for forest products, including energy. As stated by the Intergovernmental Panel on Climate Change, "In the long term, a sustainable forest-management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual yield of timber, fibre or energy from the forest, will generate the largest sustained mitigation benefit."

The bottom line is that EPA should complete its rulemaking on carbon accounting for biomass no matter what. Doing so will remove the cloud of uncertainty over biomass energy investment, provide an option to achieve GHG emissions reductions in federal energy policy and remove a significant deterrent to full forest owner engagement in the President's Climate Action Plan. The time to act on this is now so wood biomass and the forests that produce it can resume their role as part of the energy and climate solution.

Dave Tenny, NAFO President and CEO

NAFO is an organization of private forest owners committed to advancing federal policies that promote the economic and environmental benefits of privately-owned forests at the national level. NAFO membership encompasses more than 80 million acres of private forestland in 47 states. Working forests in the U.S. support 2.4 million jobs. To see the full economic impact of America's working forests, visit <http://www.nafoalliance.org/working-forests/jobs-economic-growth>.

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From: Dave Tenny
To: Goffman, Joseph
Sent: 2/19/2014 10:36:38 AM
Subject: Thanks and follow up
Attachments: NAFO Wood Bioenergy_Forestland Owners FINAL 20140212.pdf

Hi, Joe – thanks for taking some time for me yesterday. As always, I enjoyed the discussion.

Here is the FORISK analysis I mentioned. It provides a straight-forward snapshot of where things stand in the wood bioenergy marketplace and where they are likely to go.

I am circling back with our team to determine how quickly we can share our analysis with you and your legal and technical teams. I will have our availability to you asap.

Thanks again.

Dave

David P. Tenny
President and CEO
National Alliance of Forest Owners
122 C Street, NW, Suite 630
Washington, D.C. 20001
Office: (202) 747-0739
Fax: (202) 824-0770
Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Goffman, Joseph
To: Wood, Anna
Sent: 2/19/2014 1:03:51 PM
Subject: Fw: Thanks and follow up
Attachments: NAFO Wood Bioenergy_Forestland Owners FINAL 20140212.pdf

From: Dave Tenny <dtenny@nafoalliance.org>
Sent: Wednesday, February 19, 2014 10:36:38 AM
To: Goffman, Joseph
Subject: Thanks and follow up

Hi, Joe – thanks for taking some time for me yesterday. As always, I enjoyed the discussion.

Here is the FORISK analysis I mentioned. It provides a straight-forward snapshot of where things stand in the wood bioenergy marketplace and where they are likely to go.

I am circling back with our team to determine how quickly we can share our analysis with you and your legal and technical teams. I will have our availability to you asap.

Thanks again.

Dave

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Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Noe, Paul
To: Goffman, Joseph
Sent: 2/11/2014 6:55:02 PM
Subject: RE: Catch up
Attachments: Air Issues AF&PA slides v1 2-12-14.pptx

Joe: Please see attached.

Best regards

Paul

Paul Noe
Vice President for Public Policy
Paul_Noe@afandpa.org
(202) 463-2777
AMERICAN FOREST & PAPER ASSOCIATION
1101 K Street, N.W., Suite 700
Washington, D.C. 20005

-----Original Message-----

From: Goffman, Joseph [mailto:Goffman.Joseph@epa.gov]
Sent: Tuesday, February 11, 2014 6:32 PM
To: Noe, Paul
Subject: Re: Catch up

Very helpful. Thanks.

From: Noe, Paul <Paul_Noe@afandpa.org>
Sent: Tuesday, February 11, 2014 4:05:45 PM
To: Goffman, Joseph
Subject: RE: Catch up

Joe: Would it be helpful if I sent you slides on the issues we want to cover when we see you?

Paul

-----Original Message-----

From: Goffman, Joseph [mailto:Goffman.Joseph@epa.gov]
Sent: Tuesday, February 11, 2014 12:57 PM
To: Noe, Paul
Subject: Re: Catch up

Sure. I have a long day scheduled. Would 7 or 8 be too late?

From: Noe, Paul <Paul_Noe@afandpa.org>
Sent: Tuesday, February 11, 2014 12:48:39 PM
To: Goffman, Joseph
Subject: Catch up

Joe: can I catch you by phone briefly at end of the day -- after 5pm?

Paul Noe

From: rich.gold@hklaw.com
To: Goffman, Joseph
Sent: 1/16/2014 9:44:46 AM
Subject: Fw: McCabe Meeting Request
Attachments: McCabe Meeting Request 021214.pdf

Who should I contact?

Richard Gold | Holland & Knight
Partner
800 17th Street N.W., Suite 1100 | Washington DC 20006
Phone 202.457.7143 | Fax 202.955.5564
rich.gold@hklaw.com | www.hklaw.com

[Add to address book](#) | [View professional biography](#)

From: Noe, Paul
Sent: Thursday, January 16, 2014 7:07 AM
To: Gold, Richard (WAS - X77143)
Cc: Missimer, Katie; Hunt, Tim; Bartheld, Elizabeth
Subject: McCabe Meeting Request

Rich:

Could we ask your help in setting up a meeting with Janet McCabe? This is with our Environment Resource Committee (VPs of Environment), which is meeting in DC on Wed. Feb. 12 from 8:30am-2:30pm. We of course will accommodate her schedule, but the best scenario would be if she can join us at our office. If it is better to meet at her office, end of our meeting is best - around 2pm.

Please call to discuss when you have a moment on my cell (703) (b) (6).

I will follow up on another issue as well.

Thank you.

Paul

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From: Dave Tenny
To: Goffman, Joseph
Sent: 12/4/2013 2:14:16 PM
Subject: Latest NAFO blog - Five fundamentals to a practical biomass carbon policy

Hi, Joe – I thought you might be interested in our latest blog. Good luck with your meetings this week. ;)

Dave

David P. Tenny
 President and CEO
 National Alliance of Forest Owners
 122 C Street, NW, Suite 630
 Washington, D.C. 20001
 Office: (202) 747-0739
 Fax: (202) 824-0770
 Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Gretchen Schaefer [<mailto:gschaefer@nafoalliance.org>]
Sent: Wednesday, December 04, 2013 2:08 PM
To: Dave Tenny
Subject: Five fundamentals to a practical biomass carbon policy



National Alliance of Forest Owners
Investing in the Future of America's Forests

A blog from Dave Tenny, NAFO President and CEO, December 4, 2013

Five fundamentals to a practical biomass carbon policy

As the year winds down and the U.S. Environmental Protection Agency's (EPA) efforts intensify on amendments to its greenhouse gas regulations (commonly referred to as the "Tailoring Rule") addressing the unique carbon attributes of wood biomass, the agency will undoubtedly receive plenty of advice on how to develop a "good" policy that squares with the prevailing science. What constitutes "good" is usually in the eye of the beholder, and EPA has a range of policy options to consider. However, there are a number of **fundamentals** the agency must apply to craft a policy that is supported by sound science while providing a practical path toward true carbon benefits from biomass energy.

1. Carbon accounting methods should clarify rather than distort the carbon picture. The science is conclusive that biomass energy provides significant carbon benefits compared to fossil fuels. More than 100 notable scientists made this point in a letter to EPA when the agency first published the Tailoring Rule. However, the debate beneath the science, to the extent there is one, focuses on how the agency should construct a carbon accounting framework - the policy tool the agency will use to determine the carbon impacts of biomass energy.

Framework questions focus on factors such as timeframes (e.g., longer or shorter), the size of the

forest area considered (e.g., a single tree or stand, a landscape, a region or the nation as a whole), and how to count carbon change (e.g., against a point in time reference using actual data or along a continuum using assumptions and algorithms) that can sometimes be manipulated to distort the full carbon picture. In some instances these distortions are presented as “new” science when they are merely the outcome of policy preferences. Yet, when considering the available options for carbon accounting, most carbon experts agree that shorter timeframes, smaller land areas and overly complicated measuring approaches, distort the carbon picture - in some cases to suggest that fossil fuels are more carbon beneficial than biomass. Conversely, longer timeframes, larger land areas and the reliance on data over assumptions consistently provide a more clear and precise carbon picture better reflecting the full long-term benefits of biomass energy.

2. Strong markets provide forest carbon benefits by promoting forest retention and reforestation. Data consistently show that markets for forest products and services provide a powerful incentive to retain privately owned forests as forests. Forest owners make management decisions, such as when, how and whether to replant, based on market outlook. Simply speaking, when markets are strong, forests thrive. That is why from 1953 to 2011, when society demanded the most from our forests, overall forest extent in the U.S. remained constant and the total volume of growing trees increased by 50%.

3. Carbon beneficial bioenergy markets are developing gradually and rely on clear policy signals to remain viable. Reliable data show that bioenergy production in the U.S. is much more gradual today than the boom projections of recent years anticipated. New bioenergy plants are emerging in “wood baskets” where traditional facilities have closed and where wood supply is plentiful. As this market matures, it is crucial that federal policy remove the cloud of uncertainty that hangs over weary investors and send a clear, unambiguous message that biomass energy is a welcome part of our nation's overall energy mix, both because it is renewable and because it is carbon beneficial.

4. Forest economics will maximize carbon benefits by driving low rather than high value material toward bioenergy. Bioenergy provides an economically important end use for low value biomass but is a poor option for higher value wood. Projections that energy markets will drive large scale conversion of sawtimber plantations into biomass plantations that store less carbon simply don't pencil out. Market data show that a marginal increase in wood demand for biomass used in energy production will comprise between 4% and 9% of overall wood consumption of forest materials in the U.S. by 2023 and will consist primarily of forest residuals and pulpwood. Even using conservative price assumptions for high value wood, the demand for biomass for energy would have to double beyond current projections to make the conversion of sawtimber plantations to bioenergy plantations even marginally economic.

5. The use of biomass for energy is a sustainable forest practice with long-term carbon benefits. Forest sustainability is a concept that applies to forestry as a whole and is not segregated among wood uses. It is also a concept that works hand-in-hand with forest economics. Just as strong markets promote forest growth and retention, so too do they promote investment in sustainable forest practices that produce healthier trees capable of storing more carbon in shorter timeframes. Market data show that bioenergy markets will strengthen rather than threaten net forest growth over the long term. However, experts warn that a significant and growing threat to forest sustainability and the associated carbon benefits is declining markets that push forests into non-forest uses.

There is no question that EPA has a challenging task in the weeks ahead. However, by applying these fundamentals, the agency can apply sound science working with rather than against

emerging bioenergy markets. The outcome will be a practical policy that promotes more renewable energy, more healthy forests and a better climate.

Dave Tenny, NAFO President and CEO

NAFO is an organization of private forest owners committed to advancing federal policies that promote the economic and environmental benefits of privately-owned forests at the national level. NAFO membership encompasses more than 80 million acres of private forestland in 47 states. Working forests in the U.S. support 2.4 million jobs. To see the full economic impact of America's working forests, visit <http://www.nafoalliance.org/working-forests/jobs-economic-growth>.

This message was sent from Gretchen Schaefer to dtenny@nafoalliance.org. It was sent from: National Alliance of Forest Owners, 122 C Street NW Suite 630, Washington, DC 20001.
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January 15, 2014

Ms. Janet McCabe
Acting Assistant Administrator for Air & Radiation
United States Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N. W.
Washington, DC 20460

Dear Acting Assistant Administrator McCabe,

During the past several years, the American Forest & Paper Association (AF&PA) has worked constructively with you and your staff on a number of issues, and we appreciate that opportunity. As we look ahead, there are many important issues pending under your purview, including the Kraft Pulp NSPS, Boiler MACT reconsideration, the Accounting Framework and regulation on biogenic CO₂ emissions, NAAQS permitting, the Utility NSPS for greenhouse gases, and the Ozone NAAQS. We would welcome the opportunity to discuss these issues with you and how we can be helpful in the effort to achieve sustainable regulation that meets economic needs, environmental concerns, and social expectations.

Member company officials responsible for environmental policy will be visiting Washington, DC on February 12, 2014 from 8:30am to 2:30pm, and would like to meet with you about their perspectives on these issues. We would be happy to meet either at your office or to have you join our meeting at our office.

AF&PA is the national trade association of the forest products industry, representing pulp, paper, packaging and wood products manufacturers, and forest land owners. Our companies make products essential for everyday life from renewable and recyclable resources that sustain the environment. The forest products industry employs approximately 900,000 people and is among the top 10 manufacturing sector employers in 47 states.

Janet McCabe
January 15
Page 2

We will follow up with your office soon, but if you have any questions, please feel free to contact me or Katie Missimer (202-463-5179). Thank you for your consideration.

Best Regards,

A handwritten signature in dark ink, appearing to read "Paul R. Noe". The signature is fluid and cursive, with the first name "Paul" and last name "Noe" clearly distinguishable.

Paul R. Noe
Vice President, Public Policy

From: Goffman, Joseph
To: Bittleman, Sarah
Sent: 9/8/2013 12:30:56 PM
Subject: Fw: Articles describing the economic forces affecting land use change in the U.S.
Attachments: Hardie Gottleib Wear 2000 Response of R and U land uses to land rent determinants in South Land Econ.pdf; Lubowski Plantinga Stavins 2008 What drives land use change in the US Land Econ.pdf

Fyi.

From: Goffman, Joseph
Sent: Sunday, September 08, 2013 12:30:32 PM
To: Dunham, Sarah; DeMocker, Jim; Irving, Bill
Cc: Jenkins, Jennifer; Ohrel, Sara; Wood, Anna; Doster, Brian
Subject: Fw: Articles describing the economic forces affecting land use change in the U.S.

Fyi - making a land use policy-based argument for differential treatment of biogenic CO2 emissions under PSD and Title V.
 Thanks.

From: Miner, Reid <RMiner@NCASI.org>
Sent: Sunday, September 08, 2013 12:16:57 PM
To: Goffman, Joseph; Jenkins, Jennifer; Ohrel, Sara
Cc: Elaine Oneil; 'Jim Bowyer'; 'Buford, Marilyn -FS'; sedjo@rff.org; robertcabt@gmail.com; 'Bob Abt'; 'Skog, Kenneth E -FS'; 'Robert W. Malmshiemer'; 'O'Laughlin, Jay'; barnwellj@safnet.org; Lucier, Alan
Subject: Articles describing the economic forces affecting land use change in the U.S.

Dear Joe, Sara and Jennifer

During the meeting on July 30 where we discussed a manuscript prepared by a team of members of the Society of American Foresters, we were asked to provide copies of papers describing the economic forces contributing to gains and losses in forested area in the U.S.

The attached two papers (Hardie et al. and Lubowski et al.) provide the basis for much of the modeling that has been done in this area. Both use empirical data to estimate factors (e.g. elasticities) used in models of land use and land use change. The results have been used a range of studies exploring the impacts of markets on forested area and carbon (e.g. . Daigneault, A., Sohngen, B. & Sedjo, R. Economic approach to assess the forest carbon implications of biomass energy. *Environmental Science and Technology* 46, 5664–5671 (2012); Abt, R. C., Galik, C. S. & Henderson, J. D. The Near-term Market and Greenhouse Gas Implications of Forest Biomass Utilization in the Southeastern United States. CCPP 10-01, Nicholas School of the Environment, Duke University, 2010; various studies involving the use of FASOM).

The results of such studies provide important evidence of investment responses to demand for forest biomass that offset reductions in forest carbon stocks attributable to increased removals, especially in the Southern U.S.. These studies also confirm that it is not the demand for forest biomass that is threatening forest area in the U.S., but instead, that demand for forest biomass helps prevent loss of forested area.

We hope you find this information helpful.

Best Regards

Reid

Reid Miner, Member, Society of American Foresters

*Contact information:
 Vice President-Sustainable Manufacturing
 NCASI
 P.O.Box 13318
 Research Triangle Park, NC 27709
 Phone +1 (919) 941-6407
 Mobile +1 (919) 600-1022
 Fax +1 (919) 941-6401
 Email: RMiner@ncasi.org*

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From: Dave Tenny
To: Goffman, Joseph
Sent: 8/9/2013 11:04:46 AM
Subject: RE: Just email me the document if you want me to see it\$ Thanks.
Attachments: Potential Biogenic Amendments White Paper.doc

Thanks, Joe. Here it is. It is pretty high level, but it does provide a hopefully plausible path forward. A number of the concepts may resonate with other organizations, while others may not.

If you don't mind, I would prefer that you not distribute this outside of EPA for now as we are having discussions with other groups to hopefully gain support. I just didn't want to lose the window for sharing it with you.

Thanks, Joe.

Dave

*David P. Tenny
President and CEO
National Alliance of Forest Owners
122 C Street, NW, Suite 630
Washington, D.C. 20001
Office: (202) 747-0739
Fax: (202) 824-0770
Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org*

From: Goffman, Joseph [mailto:Goffman.Joseph@epa.gov]
Sent: Friday, August 09, 2013 10:05 AM
To: Dave Tenny
Subject: Just email me the document if you want me to see it\$ Thanks.

From: Browne, Cynthia
To: Chip Murray; Goffman, Joseph
Sent: 8/1/2013 11:11:09 AM
Subject: RE: Meeting

Thank you, will do.

Cynthia Browne

From: Chip Murray [mailto:cmurray@nafoalliance.org]
Sent: Thursday, August 01, 2013 11:10 AM
To: Browne, Cynthia; Goffman, Joseph
Subject: RE: Meeting

Cynthia, please include Dave Tenny on the security list. I will not be attending, so you can drop my name. Thanks, Chip

Chip Murray
Vice President for Policy & General Counsel
National Alliance of Forest Owners
(202) 747-0742

www.nafoalliance.org

From: Seth Ginther [mailto:SGinther@hf-law.com]
Sent: Friday, July 26, 2013 4:55 PM
To: Browne, Cynthia; Goffman, Joseph; Chip Murray
Cc: Jessica Brooks; Dave Tenny
Subject: RE: Meeting

Lets go with Thursday 2:30 – 3:15. Thanks! I may have a member or two join me, am doing some polling now.

From: Browne, Cynthia [mailto:Browne.Cynthia@epa.gov]
Sent: Friday, July 26, 2013 4:09 PM
To: Seth Ginther; Goffman, Joseph; 'Chip Murray'
Cc: Jessica Brooks
Subject: RE: Meeting

Hi Chip,

Here are dates/times when Joe is available:

Tuesday, July 30: 3:45 – 4:30 pm
Wednesday, July 31: 3:30 – 4:15 pm
Thursday, August 1: 2:30 – 3:15 pm
Friday, August 2: 2:00- 2:45 pm

Let me know what works best and I can send out a scheduler with the logistics.

Thank you,

Cynthia Browne
Immediate Office of Air and Radiation
ARN Room 5406

U.S. Environmental Protection Agency

Email: browne.cynthia@epa.gov

Office: 202-564-7404

From: Seth Ginther [<mailto:SGinther@hf-law.com>]

Sent: Friday, July 26, 2013 2:44 PM

To: Goffman, Joseph; 'Chip Murray'

Cc: Browne, Cynthia; Jessica Brooks

Subject: RE: Meeting

Thanks Joe. We look forward to it. We are in town next week from Tuesday to Friday if any of those days are open.

Sent with Good (www.good.com)

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-----Original Message-----

From: Goffman, Joseph [Goffman.Joseph@epa.gov]

Sent: Friday, July 26, 2013 02:32 PM Eastern Standard Time

To: Chip Murray

Cc: Seth Ginther; Browne, Cynthia

Subject: Re: Meeting

Cynthia will take it from here. Thanks.

From: Chip Murray <cmurray@nafoalliance.org>

Sent: Friday, July 26, 2013 2:25:34 PM

To: Goffman, Joseph

Cc: Seth Ginther

Subject: Meeting

Joe, the pellet industry would like to come in and brief you on a report they have recently completed. The report informs stakeholders about current biomass sourcing practices for industrial wood pellets, highlights the key role of Sustainable Forest Management (SFM) in forest-based biomass energy production, outlines commercial realities of SFM decision making in the context of healthy forests used for multiple purposes, and critically examines the carbon dynamics of forests from which biomass fuels are obtained. With regard to the latter, the report points out the critical nature of assumptions in forest bioenergy carbon modeling, brings forth views from the bioenergy sector regarding criticisms raised in several recent reports, and examines the carbon implications of several scenarios of biomass importation for EU bioenergy production.

Would you and the appropriate staff have time available in the next week or so to meet with Seth Ginther and his team?

Thanks, Chip

Chip Murray
Vice President for Policy & General Counsel
National Alliance of Forest Owners
(202) 747-0742

www.nafoalliance.org

From: Chip Murray
To: Browne, Cynthia; Goffman, Joseph
Sent: 8/1/2013 11:09:37 AM
Subject: RE: Meeting

Cynthia, please include Dave Tenny on the security list. I will not be attending, so you can drop my name. Thanks, Chip

Chip Murray
Vice President for Policy & General Counsel
National Alliance of Forest Owners
(202) 747-0742

www.nafoalliance.org

From: Seth Ginther [mailto:SGinther@hf-law.com]
Sent: Friday, July 26, 2013 4:55 PM
To: Browne, Cynthia; Goffman, Joseph; Chip Murray
Cc: Jessica Brooks; Dave Tenny
Subject: RE: Meeting

Lets go with Thursday 2:30 – 3:15. Thanks! I may have a member or two join me, am doing some polling now.

From: Browne, Cynthia [mailto:Browne.Cynthia@epa.gov]
Sent: Friday, July 26, 2013 4:09 PM
To: Seth Ginther; Goffman, Joseph; 'Chip Murray'
Cc: Jessica Brooks
Subject: RE: Meeting

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Let me know what works best and I can send out a scheduler with the logistics.

Thank you,

Cynthia Browne
Immediate Office of Air and Radiation
ARN Room 5406
U.S. Environmental Protection Agency
Email: browne.cynthia@epa.gov
Office: 202-564-7404

From: Seth Ginther [mailto:SGinther@hf-law.com]
Sent: Friday, July 26, 2013 2:44 PM
To: Goffman, Joseph; 'Chip Murray'
Cc: Browne, Cynthia; Jessica Brooks

Subject: RE: Meeting

Thanks Joe. We look forward to it. We are in town next week from Tuesday to Friday if any of those days are open.

Sent with Good (www.good.com)

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-----Original Message-----

From: Goffman, Joseph [Goffman.Joseph@epa.gov]
Sent: Friday, July 26, 2013 02:32 PM Eastern Standard Time
To: Chip Murray
Cc: Seth Ginther; Browne, Cynthia
Subject: Re: Meeting

Cynthia will take it from here. Thanks.

From: Chip Murray <cmurray@nafoalliance.org>
Sent: Friday, July 26, 2013 2:25:34 PM
To: Goffman, Joseph
Cc: Seth Ginther
Subject: Meeting

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Thanks, Chip

Chip Murray
Vice President for Policy & General Counsel
National Alliance of Forest Owners
(202) 747-0742

www.nafoalliance.org

From: Goffman, Joseph
To: Chip Murray
CC: Seth Ginther; Browne, Cynthia
Sent: 7/26/2013 2:32:00 PM
Subject: Re: Meeting

Cynthia will take it from here. Thanks.

From: Chip Murray <cmurray@nafoalliance.org>
Sent: Friday, July 26, 2013 2:25:34 PM
To: Goffman, Joseph
Cc: Seth Ginther
Subject: Meeting

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Thanks, Chip

*Chip Murray
Vice President for Policy & General Counsel
National Alliance of Forest Owners
(202) 747-0742*

www.nafoalliance.org

From: Seth Ginther
To: Browne, Cynthia; Goffman, Joseph; 'Chip Murray'
CC: Jessica Brooks; 'dtenny@nafoalliance.org'
Sent: 7/26/2013 5:17:52 PM
Subject: RE: Meeting

Sure

Seth Ginther, Executive Director US Industrial Pellet Association

Jessica Brooks, Deputy Director US Industrial Pellet Association

Tentative are

Peter OKeefe, EcoFuels
Thomas Meth, Enviva
Elizabeth Woodworth, Enviva

Sent with Good (www.good.com)

-----Original Message-----

From: Browne, Cynthia [Browne.Cynthia@epa.gov]
Sent: Friday, July 26, 2013 04:59 PM Eastern Standard Time
To: Seth Ginther; Goffman, Joseph; 'Chip Murray'
Cc: Jessica Brooks; dtenny@nafoalliance.org
Subject: RE: Meeting

Sounds good. I am going to send out a scheduler shortly and would appreciate it if you can spell out the names of the attendees from your shop.

Thank you, Cynthia Browne.

From: Seth Ginther [<mailto:SGinther@hf-law.com>]
Sent: Friday, July 26, 2013 4:55 PM
To: Browne, Cynthia; Goffman, Joseph; 'Chip Murray'
Cc: Jessica Brooks; dtenny@nafoalliance.org
Subject: RE: Meeting

Lets go with Thursday 2:30 – 3:15. Thanks! I may have a member or two join me, am doing some polling now.

From: Browne, Cynthia [<mailto:Browne.Cynthia@epa.gov>]
Sent: Friday, July 26, 2013 4:09 PM
To: Seth Ginther; Goffman, Joseph; 'Chip Murray'
Cc: Jessica Brooks
Subject: RE: Meeting

Hi Chip,

Here are dates/times when Joe is available:

Tuesday, July 30: 3:45 – 4:30 pm

Wednesday, July 31: 3:30 – 4:15 pm
Thursday, August 1: 2:30 – 3:15 pm
Friday, August 2: 2:00- 2:45 pm

Let me know what works best and I can send out a scheduler with the logistics.

Thank you,

Cynthia Browne
Immediate Office of Air and Radiation
ARN Room 5406
U.S. Environmental Protection Agency
Email: browne.cynthia@epa.gov
Office: 202-564-7404

From: Seth Ginther [<mailto:SGinther@hf-law.com>]
Sent: Friday, July 26, 2013 2:44 PM
To: Goffman, Joseph; 'Chip Murray'
Cc: Browne, Cynthia; Jessica Brooks
Subject: RE: Meeting

Thanks Joe. We look forward to it. We are in town next week from Tuesday to Friday if any of those days are open.

Sent with Good (www.good.com)

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From: Goffman, Joseph [Goffman.Joseph@epa.gov]
Sent: Friday, July 26, 2013 02:32 PM Eastern Standard Time
To: Chip Murray
Cc: Seth Ginther; Browne, Cynthia
Subject: Re: Meeting

Cynthia will take it from here. Thanks.

From: Chip Murray <cmurray@nafoalliance.org>
Sent: Friday, July 26, 2013 2:25:34 PM
To: Goffman, Joseph
Cc: Seth Ginther
Subject: Meeting

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From: Browne, Cynthia
To: Seth Ginther; Goffman, Joseph; 'Chip Murray'
CC: Jessica Brooks; dtenny@nafoalliance.org
Sent: 7/26/2013 4:59:07 PM
Subject: RE: Meeting

Sounds good. I am going to send out a scheduler shortly and would appreciate it if you can spell out the names of the attendees from your shop.

Thank you, Cynthia Browne.

From: Seth Ginther [mailto:SGinther@hf-law.com]
Sent: Friday, July 26, 2013 4:55 PM
To: Browne, Cynthia; Goffman, Joseph; 'Chip Murray'
Cc: Jessica Brooks; dtenny@nafoalliance.org
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 ARN Room 5406
 U.S. Environmental Protection Agency
 Email: browne.cynthia@epa.gov
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To: Goffman, Joseph; 'Chip Murray'
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National Alliance of Forest Owners
(202) 747-0742

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From: Seth Ginther
To: Browne, Cynthia; Goffman, Joseph; 'Chip Murray'
CC: Jessica Brooks; dtenny@nafoalliance.org
Sent: 7/26/2013 4:54:55 PM
Subject: RE: Meeting

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Cc: Jessica Brooks
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Cynthia Browne
 Immediate Office of Air and Radiation
 ARN Room 5406
 U.S. Environmental Protection Agency
 Email: browne.cynthia@epa.gov
 Office: 202-564-7404

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ED_000419-0000373

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National Alliance of Forest Owners
(202) 747-0742*

www.nafoalliance.org

From: Browne, Cynthia
To: Seth Ginther; Goffman, Joseph; 'Chip Murray'
CC: Jessica Brooks
Sent: 7/26/2013 4:08:49 PM
Subject: RE: Meeting

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www.nafoalliance.org

From: Seth Ginther
To: Goffman, Joseph; 'Chip Murray'
CC: Browne, Cynthia; Jessica Brooks
Sent: 7/26/2013 2:43:42 PM
Subject: RE: Meeting

Thanks Joe. We look forward to it. We are in town next week from Tuesday to Friday if any of those days are open.

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Vice President for Policy & General Counsel
National Alliance of Forest Owners
(202) 747-0742

www.nafoalliance.org

From: Chip Murray
To: Goffman, Joseph
Sent: 7/26/2013 2:41:54 PM
Subject: RE: Meeting

Thanks Joe.

Chip Murray
Vice President for Policy & General Counsel
National Alliance of Forest Owners
(202) 747-0742

www.nafoalliance.org

From: Goffman, Joseph [mailto:Goffman.Joseph@epa.gov]
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National Alliance of Forest Owners
(202) 747-0742*

www.nafoalliance.org

From: Dave Tenny
To: Robert Bonnie (robert.bonnie@osec.usda.gov); 'Jensen, Jay (b)(6) privacy'; Goffman, Joseph; Bittleman, Sarah
Sent: 6/26/2013 9:24:33 AM
Subject: NAFO Blog on President's Climate Action Plan

Good morning, everyone—I wanted to pass on my blog on the President's announcement yesterday. We look forward to working with all of you on next steps. Thanks for including us.

Dave

David P. Tenny
 President and CEO
 National Alliance of Forest Owners
 122 C Street, NW, Suite 630
 Washington, D.C. 20001
 Office: (202) 747-0739
 Fax: (202) 824-0770
 Cell: (703) 964-7519
dtenny@nafoalliance.org
www.nafoalliance.org

From: Gretchen Schaefer [mailto:gschaefer@nafoalliance.org]
Sent: Tuesday, June 25, 2013 7:44 PM
To: Dave Tenny
Subject: Administration's climate change actions must align with the economics of forest ownership



A blog from Dave Tenny, NAFO President and CEO, June 25, 2013

Administration's climate change actions must align with the economics of forest ownership

Today President Obama unveiled his Climate Action Plan, an ambitious agenda of administrative actions to address climate change. His plan appropriately identifies the important role of our nation's forests in reducing carbon in the air and affirms that our forests, especially the 60 percent that are privately owned and managed "working forests," are part of the climate change solution.

The President is on to something powerful provided the actions following his announcement align with the economic drivers that promote ownership of private working forests for the long term.

Shortly after NAFO was founded in 2008, a diverse group of organizations including forest owners and operators, conservation organizations and environmental groups convened and identified the top drivers to keep working forests economically viable.

Strong markets. Working forests can only continue providing substantial environmental benefits if there are dependable markets for the goods and services they provide. These markets provide returns to forest owners that are reinvested in forest stewardship that has resulted in 50 percent more total tree volume in the U.S. today (and correspondingly 50 percent more stored carbon) compared to the 1950s. Today our forests remove 14 percent of our nation's industrial carbon emissions from the air each year.

Forest owners can grow even more trees on their land and remove even more carbon from the air if the marketplace gives them a reason to do it. A study by experts from the University of Georgia and North Carolina State University concluded, for example, that forest owners in the South could increase tree growth on their land from between 75 percent and 150 percent in response to favorable market conditions.

This means that the more we can promote the markets that produce lumber for our homes, paper and packaging for the books we read and the products we buy at the grocery store, and the energy that runs our businesses and powers our homes, the more carbon our forests will ultimately remove from the atmosphere.

Public investment. Working forests are under great pressure to convert to other land uses, even when markets are strong. Death, sickness and the ever-rising cost of living can often create the tipping point that compels forest owners to convert their forestland to other uses.

Wise public investment in conservation coupled with tax policies that recognize and accommodate long-term investments in forest management are effective in helping to keep private forestland economically competitive with other land uses and hedging against conversion.

Aligned legal and regulatory framework. Sometimes laws and rules work together well to promote private forest ownership and investment, and sometimes they don't. Making sure they are aligned in a way that support public benefits, like carbon storage, is vital. This includes federal policies currently before the U.S. Environmental Protection Agency determining how to capture the full carbon benefits of forest bioenergy as an alternative to fossil fuels.

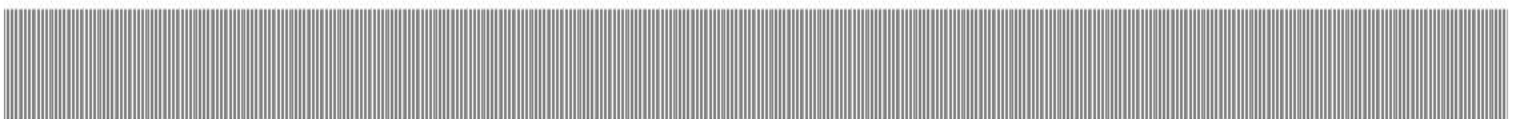
The Intergovernmental Panel on Climate Change provides perhaps the best summation of the path ahead for the Obama Administration:

"In the long term, a sustainable forest-management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual yield of timber, fibre or energy from the forest, will generate the largest sustained mitigation benefit."

Administrative actions preserving the three economic drivers will encourage forest owners to enthusiastically do their part as contributors to the climate change solution. We stand ready to work with the President's team to advance policies that make sure we can.

Dave Tenny, NAFO President and CEO

NAFO is an organization of private forest owners committed to advancing federal policies that promote the economic and environmental benefits of privately-owned forests at the national level. NAFO membership encompasses more than 80 million acres of private forestland in 47 states. Working forests in the U.S. support 2.5 million jobs. To see the full economic impact of America's working forests, visit www.nafoalliance.org/economic-impact-report.



This message was sent from Gretchen Schaefer to dtenny@nafoalliance.org. It was sent from: National Alliance of Forest Owners, 122 C Street NW Suite 630, Washington, DC 20001.
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From: Noe, Paul
To: Goffman, Joseph
Sent: 6/20/2013 8:00:11 AM
Subject: Bob P's Intro
Attachments: Air Issues Background EPA 6-13.docx; image001.jpg

Joe:

Can you do me a favor and relay some info to Bob's speechwriter first thing this am? I have a voicemail from Bob's speechwriter, Stephanie Ebner(sp?) asking for a little info on his introduction and issues he will be asked to focus on. I only got the message now because I was tied up w our Fly-In and Board dinner yesterday. I could not find her email address on the EPA locator so could only leave a voicemail. Here is info that she was looking for:

First, Bob will be introduced by the Chairman of our Board, Dave Scheible, the CEO of Graphic Packaging. Below is the intro Dave will give. Bob will be asked about the issues we discussed earlier this week -- (NAAQS (PM2.5) permitting gridlock; Ozone NAAQS; and the carbon neutrality of biomass). I am resending you the backgrounder on those issues to provide to Stephanie. He also may be asked about the supplemental proposal to the Non-Hazardous Secondary Materials Rule (to list more biomass materials as fuels, including paper recycling residuals, processed construction and demolition wood, and railroad ties). (This would ensure our boilers are subject to the Boiler MACT rule and not the Incinerator (CISWI) MACT.)

Rich Gold and I will greet Bob at the entrance to 1111 19th St NW when we arrives shortly before 9am. Please feel free to call or text me if you or Stephanie have any questions or Bob is near arrival. My cell is (703) 909-2895.

Many thanks,

Paul

 We are pleased to be joined this morning by Bob Perciasepe, the Acting Administrator of EPA.

Bob has had a long and distinguished career in public service, and he is one of the nation's preeminent experts on environmental policy. Before taking the helm at EPA early this year, Bob was confirmed as the Deputy Administrator in 2009.

Before joining the Obama Administration, Bob served as the chief operating officer at the National Audubon Society, one of the world's leading environmental organizations.

Our industry knows Bob well. We benefitted from his expertise and skills in the Cluster Rule years ago. More recently, he had an open door when we needed to talk with EPA leadership about the Boiler MACT rules. We look forward to talking with Bob about our current priority issues, including EPA's regulatory plans for the coming year on Ozone NAAQS, the permitting gridlock we have identified on particulate matter (PM), and next steps on greenhouse gas regulation of biogenic emissions.

Bob, thank you for taking time to visit with us.

Paul Noe
 Vice President for Public Policy
 AMERICAN FOREST & PAPER ASSOCIATION
 1111 19th Street, NW, Suite 800, Washington, D.C. 20036
Paul.Noe@afandpa.org
 202-463-2777 (phone)
 202-463-2772 (fax)
www.afandpa.org

***** ATTACHMENT NOT DELIVERED *****

This Email message contained an attachment named
image001.jpg

which may be a computer program. This attached computer program could contain a computer virus which could cause harm to EPA's computers, network, and data. The attachment has been deleted.

This was done to limit the distribution of computer viruses introduced into the EPA network. EPA is deleting all computer program attachments sent from the Internet into the agency via Email.

If the message sender is known and the attachment was legitimate, you should contact the sender and request that they rename the file name extension and resend the Email with the renamed attachment. After receiving the revised Email, containing the renamed attachment, you can rename the file extension to its correct name.

For further information, please contact the EPA Call Center at (866) 411-4EPA (4372). The TDD number is (866) 489-4900.

***** ATTACHMENT NOT DELIVERED *****

From: Goffman, Joseph
To: South, Peter; Ketcham-Colwill, Nancy
Sent: 6/17/2013 5:59:44 PM
Subject: FW: Air Issues Background
Attachments: Air Issues Background EPA 6-13.docx

Supersedes my previous message. Thanks.

From: Noe, Paul [mailto:Paul_Noe@afandpa.org]
Sent: Monday, June 17, 2013 5:58 PM
To: Goffman, Joseph
Subject: Air Issues Background

Joe:

As I mentioned, when Bob Perciasepe speaks at AF&PA to our Board on Thursday at 9:15am, the CEOs will be most interested in hearing about: (1) the NAAQS permitting gridlock problem; (2) Ozone NAAQS; and (3) the carbon neutrality of biomass. He also likely will be asked about the pending supplemental proposed rule to amend the Non-Hazardous Secondary Materials (NHSM) rule to list as fuels paper recycling residuals, processed construction and demolition wood, and creosote treated railroad ties.

I have quickly pulled together some points on each topic.

Please let me know if you have any questions.

Best regards,

Paul

From: Dave Tenny
To: Gilinsky, Ellen; Bittleman, Sarah; Robert Bonnie (robert.bonnie@osec.usda.gov); Goffman, Joseph
CC: Howell, Andrea (andrea.howell@weyerhaeuser.com)
Sent: 5/21/2013 3:09:06 PM
Subject: Roundtable with NAFO CEOs on Thursday, May 23
Attachments: 2. CEO Roundtable Discussion Abstract.docx

Good afternoon, everyone - attached is the final framing document for our roundtable discussion on Thursday morning. There were no significant changes from the draft I distributed earlier.

If you have any questions, please let me know. We look forward to a good discussion on Thursday morning.

Warm regards,

Dave

David P. Tenny
 President and CEO
 National Alliance of Forest Owners
 122 C Street, NW, Suite 630
 Washington, D.C. 20001
 Office: (202) 747-0739
 Fax: (202) 824-0770
 Cell: (703) 964-7519
 dtenny@nafoalliance.org
 www.nafoalliance.org

-----Original Message-----

From: Gilinsky, Ellen [mailto:Gilinsky.Ellen@epa.gov]
 Sent: Wednesday, May 08, 2013 1:54 PM
 To: Dave Tenny; Kopocis, Ken
 Subject: RE: Roundtable with NAFO CEOs on Thursday, May 23

Great. I am looking forward to it Dave.

Ellen Gilinsky

Ellen Gilinsky, Ph.D.
 Senior Policy Advisor
 EPA Office of Water
 Room 3111 EPA East, Mail Code 4101M
 1200 Pennsylvania Ave, NW
 Washington, DC 20460

Phone: 202-564-2549
 Cell: 202-236-6882
 email: gilinsky.ellen@epa.gov

-----Original Message-----

From: Dave Tenny [mailto:dtenny@nafoalliance.org]
 Sent: Wednesday, May 08, 2013 1:53 PM
 To: Kopocis, Ken
 Cc: Gilinsky, Ellen
 Subject: RE: Roundtable with NAFO CEOs on Thursday, May 23

Thanks, Ken and Ellen. Ellen, we are delighted to have you join us. This will be a very constructive session, and I think you will find our CEOs to be a very engaging group.

I will send you an abstract tomorrow framing the discussion and describing the format. This will be a draft, and I will welcome any input you have to help set the table well for the

discussion.

Thanks again.

Dave

David P. Tenny
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-----Original Message-----

From: Kopocis, Ken [mailto:Kopocis.Ken@epa.gov]
Sent: Wednesday, May 08, 2013 1:50 PM
To: Dave Tenny
Cc: Gilinsky, Ellen
Subject: RE: Roundtable with NAFO CEOs on Thursday, May 23

Dave,
Ellen has agreed to participate. I copied her on this reply to your original invitation so she has original details.
Hope you all have a good discussion. I know there are some interesting issues.
Ken

From: Dave Tenny [dtenny@nafoalliance.org]
Sent: Monday, April 22, 2013 9:45 AM
To: Bonnie Robert; Kopocis, Ken; Goffman, Joseph
Cc: Bittleman, Sarah
Subject: Roundtable with NAFO CEOs on Thursday, May 23

Good morning, Robert, Ken and Joe - first of all, Ken and Joe, I hope you are surviving Gina's confirmation process. I apologize in advance if this email is catching you still in the middle of the CFR crush.

I wanted to follow up on my earlier outreach to each of you individually concerning NAFO's upcoming Board meeting in DC at the Washington Hilton at 8:00 am on May 23. My hope is to put together a roundtable discussion with our CEOs on water and air issues of common concern to us. Ken, this would include the treatment of silviculture under the stormwater rules, waters of the U.S., etc. Joe, your part would focus on the Tailoring Rule and the role of forests/biomass in other related policies. Robert, for your part it would involve both issues along with all-lands objectives USDA is pursuing.

We have found that the roundtable format as opposed to a typical "panel" discussion is much more constructive and interactive. We would not ask you to prepare any presentations in advance, but we would send you questions that would likely be discussed so you can be prepared. We would also welcome your thoughts on topics for discussion.

We hope you will view this as a good opportunity to constructively interact with the nation's leading CEOs in the forestry sector to discuss how we can approach our common priorities in a mutually reinforcing way.

We are trying to nail down the details by the end of the month, if at all possible. If you could let me know your availability when you get a moment I would be in your debt.

Thanks, guys.

Dave

Dave Tenny
President and CEO
National Alliance of Forest Owners

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dtenney@nafoalliance.org

Sent from my iPad

From: Dave Tenny
To: Robert Bonnie (robert.bonnie@osec.usda.gov); Goffman, Joseph; Gilinsky, Ellen; Bittleman, Sarah
CC: Dan Sakura; Chip Murray
Sent: 5/9/2013 1:44:59 PM
Subject: Attached draft framing document for NAFO CEO roundtable discussion
Attachments: 1. CEO Roundtable Discussion Abstract.docx

Good afternoon everyone – thanks again for agreeing to participate in the roundtable discussion with our CEOs on Thursday, May 23, from 8:00-9:15am. We look forward to a constructive session.

Amy Castellano from our team will be in touch with you on logistics soon. Please watch for an email from her.

Also, attached is a draft framing document for our discussion. My intent is to use this to frame the discussion in a way that makes everyone comfortable. I welcome your input. We plan to send all materials to our CEOs by next Tuesday cob. Please provide your suggestions by Monday cob if at all possible. Thanks, everyone.

Dave

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Building Common Cause on Water and Carbon CEO/Policy Leader Roundtable Discussion

I. Participants

Robert Bonnie

Senior Advisor for Environment and Climate, USDA

Joe Goffman

Senior Counsel to the Assistant Administrator for Air, EPA

Dr. Ellen Gilinsky

Senior Policy Advisor to the Assistant Administrator for Water, EPA

Sarah Bittleman

Agriculture Counselor to the Administrator, EPA

Moderator: Andrea Howell, Weyerhaeuser

II. Framing the Discussion:

Carbon and water are fundamental to the role of private forests in the environment, the economy and society. Until recently public policy has uniformly recognized the positive contributions of private forests to water quality and overall atmospheric carbon levels. However, recent events are threatening to change the paradigm of private forests as a source of water quality and carbon solutions by recasting them as part of the problem.

This threat arises out of a combination of administrative and legal actions. Recent litigation over whether forest roads used for timber harvest are point sources of water pollution subject to industrial discharge permits or other federal regulation threatens to subject forestry operations to new (and ill-fitting) regulation typically reserved for industrial activities that pose significant threats to water quality. Similarly, the recent treatment of carbon emissions from forest biomass combustion the same as coal and fossil fuels under EPA's PSD Tailoring Rule threatens to change the way policy responds to the natural forest carbon cycle that has historically been credited as removing far more carbon from the atmosphere than emitted from private forest use.

Forest owners and policy makers generally agree that maintaining private forests as a viable long-term land use will help maintain water quality in rivers and streams across the country and provide an important long-term source of carbon benefits. The critical question facing both at the moment is, "How can we work together to ensure that policy promotes and preserves rather than erodes or eliminates altogether the positive contributions these forests make to air and water quality?"

Addressing the immediate policy questions impacting the role of private forests in preserving water and air quality – namely the lingering question of whether forest roads are point sources and whether biomass should be regulated the same as fossil fuels as an energy source – will largely determine whether forest owners and policy makers will be able to work together going forward on a positive agenda that further unlocks the

capability of private forests to improve water and air quality or whether these benefits will be lost as forest owners become entangled in a litigation and regulatory quagmire.

III. Discussion Format

The purpose of the roundtable format is to have a frank and open exchange between policy makers and leaders in the private forestry sector. To encourage this, roundtable participants will not be asked to prepare any opening remarks. Rather, the moderator will provide brief opening remarks to frame the discussion and move directly to questions to engage policy makers and CEOs in a dialogue.

All participants are welcome to provide questions in advance. All questions provided in advance will be given to the roundtable participants so they can be prepared to respond.

Generally, participants should be prepared to respond to some or all of the following questions, which provide a basis for discussion:

Water Quality

1. What is the prevailing view of the contributions of private forests to water quality? What is the prevailing view of the effectiveness of existing state programs that promote the use of best management practices for silvicultural contributions to water quality?
2. What is the potential impact of recent and potential future litigation, including cases in the last decade decided by the Ninth Circuit Court of Appeals, on the contributions of private forests to water quality?
3. What are the most constructive policy steps we can take to maintain the positive contributions of private forests to water quality? What are the obstacles to taking these steps and how can we overcome them?
4. What roles can Congress, the Administration and private forest owners play in providing a reliable and certain policy framework to promote the beneficial water quality contributions of private forests?

Air Quality

1. What is the prevailing view of the contributions of private forests to reducing overall carbon concentrations in the atmosphere? Does active management for economic goods and services increase or decrease the carbon benefits of private forests?
2. What should be the role of biomass energy in the nation's overall energy portfolio? What are the most significant policy challenges to meeting this objective?
3. What can forest owners and policy makers do to ensure that existing and forthcoming greenhouse gas regulations, including the Tailoring Rule, appropriately account for the natural forest carbon cycle and make the necessary distinctions with other fuel stocks?
4. How can we work together to more proactively promote the carbon benefits of private forests in policy?

From: Noe, Paul
To: Goffman, Joseph
CC: Gunning, Paul; Jenkins, Jennifer; Wood, Anna; Santiago, Juan; Ohrel, Sara; Irving, Bill; Dunham, Sarah
Sent: 1/2/2014 4:16:19 PM
Subject: Biogenic Carbon Accounting
Attachments: Biogenic Carbon Accounting Paper 112513.pdf; image001.jpg

Joe et al:

Happy New Year – I hope you had a relaxing break. I wanted to pass along our short paper on Biogenic Carbon Accounting, which includes our basic recommendations.

Best regards,

Paul

Paul Noe

Vice President for Public Policy

Paul.No@afandpa.org

(202) 463-2777

AMERICAN FOREST & PAPER ASSOCIATION

1101 K Street, N.W., Suite 700

Washington, D.C. 20005



***** ATTACHMENT NOT DELIVERED *****

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 image001.jpg

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